

**SONY®**

DIGITAL BETACAM CAMCORDER

**DVW-707/707P**

**DVW-709WS/709WSP**

**DVW-790WS/790WSP**

SDI OUTPUT BOARD

**BKDW-702**

PICTURE CACHE BOARD

**BKDW-703**

IMAGE INVERTER BOARD

**BKDW-704**

**Digital BETACAM™**

**Power HAD**

MAINTENANCE MANUAL Part 2

Volume 1 1st Edition (Revised 1)

## 警告

このマニュアルは、サービス専用です。  
お客様が、このマニュアルに記載された設置や保守、点検、修理などを行うと感電や火災、人身事故につながる可能性があります。  
危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

設置や保守、点検、修理などを行う前に、別冊のメンテナンスマニュアルPart 1の「安全のために」と別冊のオペレーションマニュアルの「安全のために」を必ずお読みください。

## WARNING

This manual is intended for qualified service personnel only.  
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

## WARNING

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.  
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

## AVERTISSEMENT

Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

DVW-707 (SY)      Serial No. 10001 and Higher  
DVW-707P (SY)    Serial No. 40001 and Higher

DVW-709WS (SY)   Serial No. 10001 and Higher  
DVW-709WSP (SY) Serial No. 40001 and Higher

DVW-790WS (SY)   Serial No. 10001 and Higher  
DVW-790WSP (SY) Serial No. 40001 and Higher

### CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.  
Dispose of used batteries according to the manufacturer's instructions.

### Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.  
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

### ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.

Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

### ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.

Udskiftning må kun ske med batteri af samme fabrikat og type.  
Levér det brugte batteri tilbage til leverandøren.

For the customers in the U.S.A. and Canada

### RECYCLING NICKEL-CADMIUM BATTERIES

Nickel Cadmium batteries are recyclable. You can help preserve our environment by returning your unwanted batteries to your nearest point for collection, recycling or proper disposal.

Note: In some areas the disposal of nickel cadmium batteries in household or business trash may be prohibited.



RBRC (Rechargeable Battery Recycling Corporation) advises you about spent battery collection by the following phone number.

**Call toll free number: 1-800-822-8837  
(United States and Canada only)**

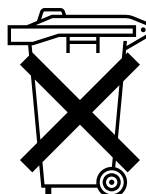
Caution: Do not handle damaged or leaking nickel-cadmium batteries.

### Voor de klanten in Nederland

Dit apparaat bevat een MnO<sub>2</sub>-Li batterij voor memory back-up.

Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.

Gooi de batterij niet weg, maar lever hem in als KCA.



Bij dit produkt zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.



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# Manual Structure

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## Purpose of this manual

This manual is the Maintenance Manual Part 2 Volume 1 of the following models:

|                           |   |
|---------------------------|---|
| Digital Betacam Camcorder | DVW-790WS/709WS/707, DVW-790WSP/709WSP/707P |
| SDI Output Board          | BKDW-702                                    |
| Picture Cache Board       | BKDW-703                                    |
| Image Inverter Board      | BKDW-704                                    |
|                           | (For DVW-790WS/790WSP/709WS/709WSP only)    |

This Maintenance Manual Part 2 is intended for use by trained system and service engineers, and provides the information that promises the parts level service (parts replacement, guideline for adjustment, schematic diagrams, board layouts, detailed parts list).

This manual (volume 1) explains about parts replacement and guideline for adjustment.

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## Contents

### Maintenance Manual Part 2 Volume 1 (9-967-819- )

This Maintenance Manual Part 2 (Volume 1 and 2) is organized by the following sections:

#### Section 1 Service Overview

Explains the fixtures, using the extension boards, and precautions for board/part replacement.

#### Section 2 Maintenance Mode

Explains the setup menu (service mode) of this unit.

#### Section 3 Parts Replacement

Explains the replacement of the boards, CCD unit, and external connectors/switches.

#### Section 4 Mechanical Deck Parts Replacement

Explains the replacement of the parts of the mechanical deck.

#### Section 5 Tape Path Alignment

Explains the tape path alignment after replacement of parts that are described in Section 4.

#### Section 6 VTR System Electrical Alignment

Explains the electrical alignment for VTR system associated with replacement of parts that are described in Section 3 and 4.

#### Section 7 Camera System Electrical Alignment (DVW-790WS/790WSP/709WS/709WSP)

Explains the electrical alignment for Camera system that is required after the DVW-790WS/790WSP/709WS/709WSP repair is repaired or its board is replaced.

## **Section 8 Camera System Electrical Alignment (DVW-707/707P)**

Explains the electrical alignment for Camera system that is required after the DVW-707/707P repair is repaired or its board is replaced.

### **Section 1 Spare Parts**

Describes the exploded views and detailed parts list.

### **Section 2 Semiconductor Pin Assignments**

Describes the semiconductor pin assignments.

### **Section 3 Block Diagrams**

Describes the block diagrams of overall and each board.

### **Section 4 Schematic Diagrams**

Describes the frame wiring and schematic diagrams for the unit.

### **Section 5 Board Layouts**

Describes the board layouts for the unit.

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## **Related manuals**

Besides this “Maintenance Manual Part 2”, the following manuals are available for this unit:

- **Operation Manual (Supplied with this unit)**

This manual is necessary for application and operation of this unit.

- **Maintenance Manual Part 1 (Supplied with this unit)**

This manual provides the information that is required to the primary services, maintenance of this unit and installation of the optional boards (BKDW-702/703/704).

- **BVF-V10/V10CE or BVF-V20W/V20WCE Maintenance Manual  
(available on request)**

These manuals are describes the service information of the supplied viewfinder. If it is required, contact your local Sony Sales Office/Service Center.

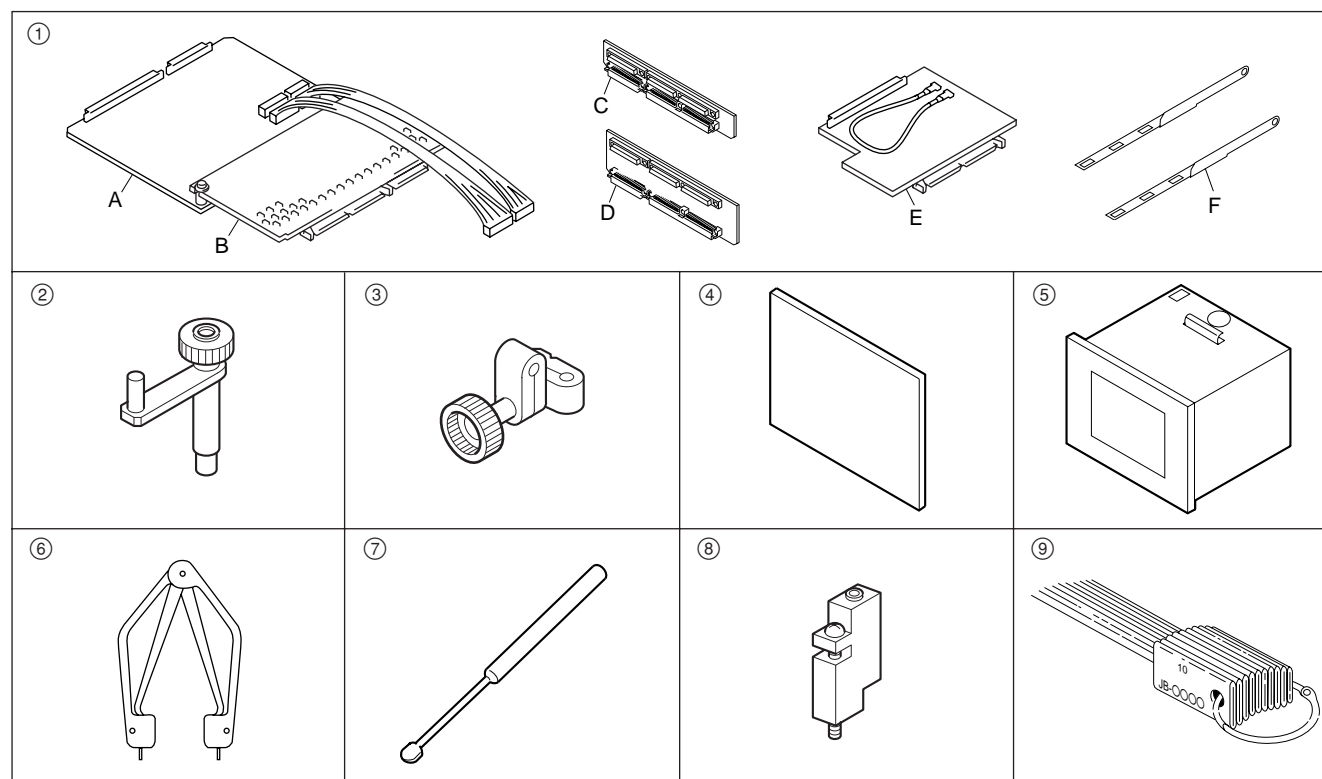
# Section 1

## Service Overview

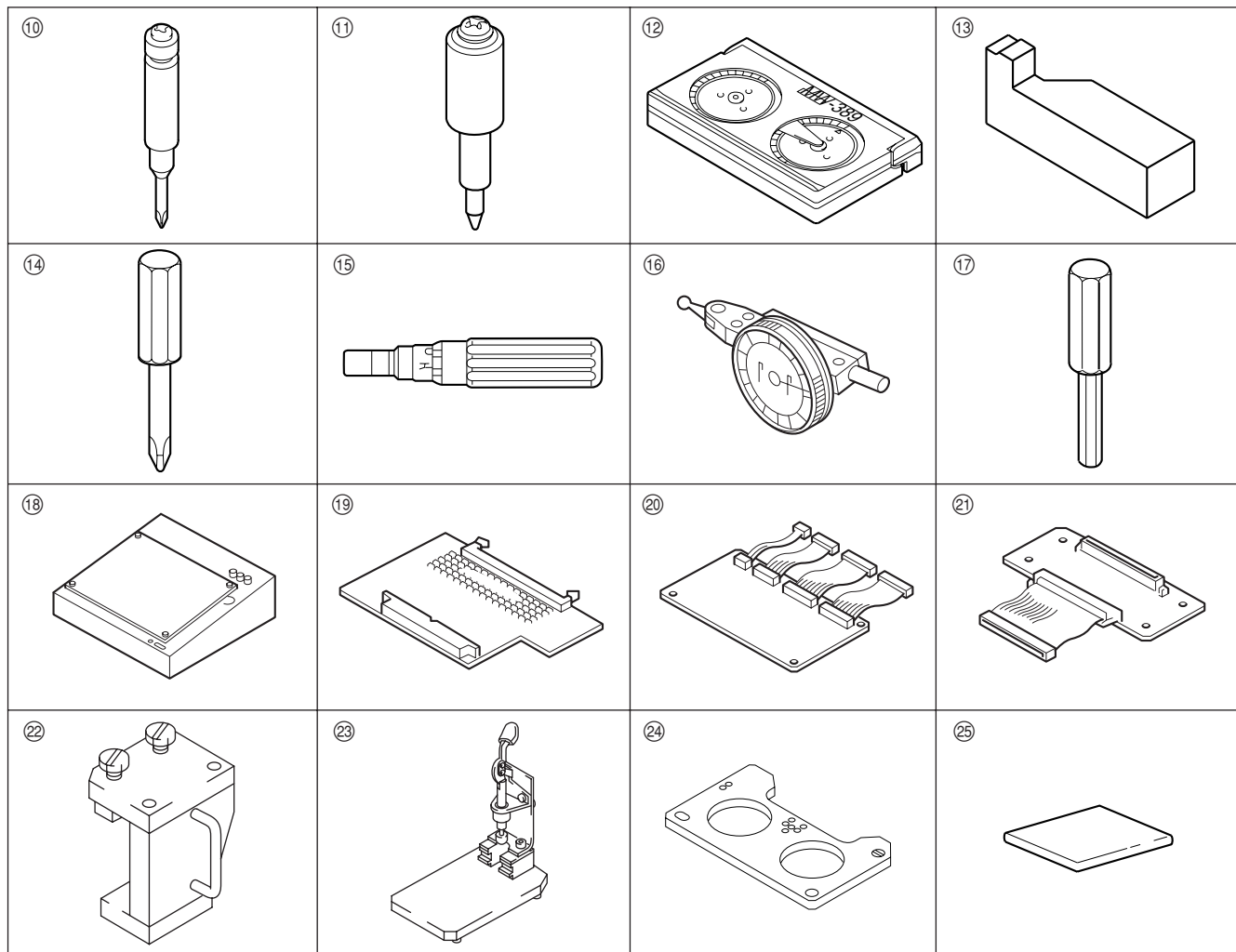
### 1-1. Fixtures and Adjustment Equipment

#### 1-1-1. Fixtures

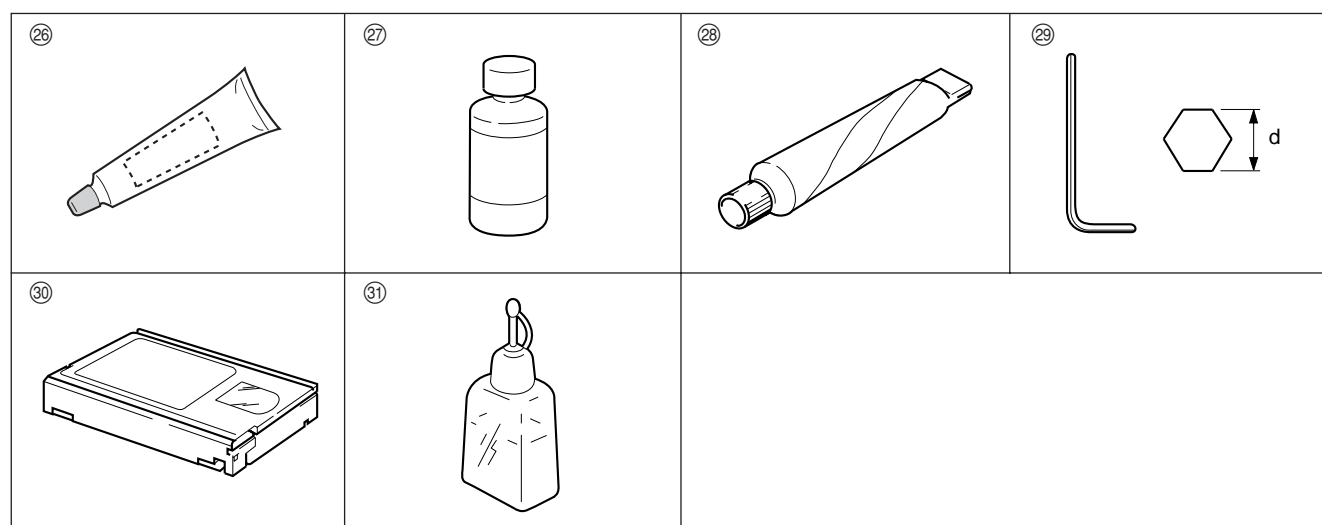
| Illust No. | Part No.               | Description  | Usage                           |
|------------|------------------------|--|---------------------------------|
| ①          | A-8322-296-A           | Extension Boards Assembly<br>(EX-655/656/657/658/667, and Stays) | Plug-in boards check/adjustment |
| ①-A        | A-8321-274-A           | EX-655 Board   |                                 |
| ①-B        | A-8321-275-A           | EX-656 Board   |                                 |
| ①-C        | A-8321-277-A           | EX-657 Board   |                                 |
| ①-D        | A-8321-278-A           | EX-658 Board   |                                 |
| ①-E        | A-8321-276-A           | EX-667 Board   |                                 |
| ①-F        | 3-193-678-01           | Stay   |                                 |
| ②          | J-6001-820-A           | Drum Eccentricity Gauge (3)                                      | Drum eccentricity adjustment    |
| ③          | J-6001-830-A           | Drum Eccentricity Gauge (2)                                      |                                 |
| ④          | J-6026-110-A           | Multi Burst Chart  | Camera adjustment               |
|            | J-6026-130-B           | Gray Scale Chart (transparent type) (4:3)                        |                                 |
|            | Commercially available | Gray Scale Chart (reflective type) (4:3)                         |                                 |
|            | J-6394-080-A           | Gray Scale Chart (transparent type) (16:9)                       |                                 |
| ⑤          | J-6029-140-B           | Pattern Box PTB-500  |                                 |
| ⑥          | J-6035-070-A           | IC External Tool (CT-2101)                                       | Extraction of IC (PLCC type)    |
| ⑦          | J-6080-840-A           | Inspection Mirror  | Video tracking adjustment       |
| ⑧          | J-6087-000-A           | Drum Eccentricity Gauge (5)                                      | Drum eccentricity adjustment    |
| ⑨          | J-6152-450-A           | Wire Clearance Check Gauge                                       | Clearance check                 |



| Illust No. | Part No.     | Description                         | Usage                               |
|------------|--------------|-------------------------------------|-------------------------------------|
| ⑩          | J-6322-420-B | Tape Guide Adjustment Driver (45)   | Tape path adjustment                |
|            | J-6322-420-3 | TG Driver Spare Bit (45)            |                                     |
| ⑪          | J-6323-530-A | Stop Washer Fastening Tool          | Stop washer installation            |
| ⑫          | J-6323-890-A | FWD Back Tension Measuring Cassette | FWD back tension adjustment         |
| ⑬          | J-6324-150-A | Reel Table Height Adjustment Tool   | Reel height adjustment              |
| ⑭          | J-6325-110-A | Torque Driver Bit (for M1.4)        | Tightening screws                   |
|            | J-6325-380-A | Torque Driver Bit (for M2)          |                                     |
| ⑮          | J-6325-400-A | Torque Driver (for 3 kg)            |                                     |
| ⑯          | J-6325-530-A | Drum Eccentricity Gauge (6)         | Drum eccentricity adjustment        |
| ⑰          | J-6326-120-A | Hexagonal Bit (1.5 mm)              | Tightening screws                   |
| ⑱          | J-6420-840-A | Channel Condition Checker           | REC current adjustment              |
| ⑲          | J-6420-900-A | MB Translate Board                  | HN board operation check            |
| ⑳          | J-6420-910-A | TP Tool                             | TP harness for tape path adjustment |
| ㉑          | J-6420-930-A | Extension Harness, 100 pin          | HN board operation check            |
| ㉒          | J-7031-630-A | PG-163, 40-pin Positioning Tool     | Positioning 40-pin                  |
| ㉓          | J-7032-150-A | PG-215, 40-pin CN Positioning Tool  | Positioning 40-pin connector        |
| ㉔          | J-7032-610-A | Cassette Reference Plate            | Reel height adjustment              |
| ㉕          | 3-184-527-01 | Cleaning Cloth                      | Cleaning                            |



| Illust No. | Part No.               | Description  | Usage                                 |
|------------|------------------------|--|---------------------------------------|
| ②⑥         | 7-432-950-03           | Sealant (TSE-392W)                                     | For water drop-proof                  |
| ②⑦         | 7-661-018-18           | Oil  | Lubricant                             |
| ②⑧         | 7-662-010-08           | Grease, SGL-701 (20 g)                                 |                                       |
| ②⑨         | 7-700-736-04           | Hexagonal Wrench (d=2.5 mm)                            | Screws removal                        |
|            | 7-700-736-05           | Hexagonal Wrench (d=1.5 mm)                            |                                       |
|            | 7-700-736-06           | Hexagonal Wrench (d=0.89 mm)                           |                                       |
| ③⑩         | 8-960-073-01           | Alignment Tape, ZR5-1                                  | Digital video/audio adjustment (NTSC) |
|            | 8-960-073-11           | Alignment Tape, ZR2-1                                  | Video tracking adjustment (NTSC)      |
|            | 8-960-073-51           | Alignment Tape, ZR5-1P                                 | Digital video/audio adjustment (PAL)  |
|            | 8-960-073-61           | Alignment Tape, ZR2-1P                                 | Video tracking adjustment (PAL)       |
| ③①         | 9-919-573-01           | Cleaning Fluid   | TTP cleaning                          |
| —          | Commercially available | Digital Betacam Video Cassette, BCT-D6/D12/D22/D32/D40 | For recording                         |
|            |                        | Cleaning Tape, BCT-D12CL                               | Cleaning video heads                  |



## 1-1-2. Adjustment Equipment

| Equipment                                    | Model Name      | Remarks                    |
|--|-----------------|----------------------------|
| Oscilloscope                                 | Tektronix 2465B |                            |
| Analog composite waveform/<br>vector monitor | Tektronix 1780R | For DVW-790WS/709WS/707    |
|  | Tektronix 1781R | For DVW-790WSP/709WSP/707P |
| Color monitor                                | BVM-1410        |                            |
| White/black monitor                          | —               |                            |

## 1-2. Using the Extension Boards

The extension boards for the plug-in boards check are available separately as spare parts.

See the table below to extend applicable board :

| Board to be checked         | Extension board   | Reference     |
|-----------------------------|-------------------|---------------|
| DCP board assembly (side A) | EX-655 and EX-656 | Section 1-2-1 |
| (side B)                    | EX-657            | Section 1-2-2 |
| DVP board assembly (side A) | EX-655 and EX-656 | Section 1-2-1 |
| (side B)                    | EX-658            | Section 1-2-2 |
| SV-210 board                | EX-667            | Section 1-2-3 |
| DC-DC converter             |                   |               |
| DIF-75 board (BKDW-702)     |                   |               |

### 1-2-1. Using the EX-655 and EX-656 Boards

The EX-655 and EX-656 boards are always connected and used in a pair.

To check/adjust the side A of the DCP and DVP board assemblies, use these extension boards.

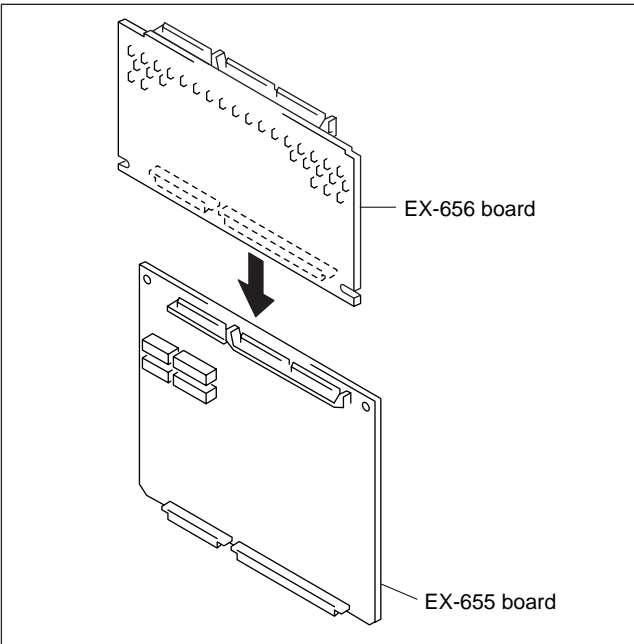
These boards are intended for the following use:

- EX-655 Board+EX-656 Board :

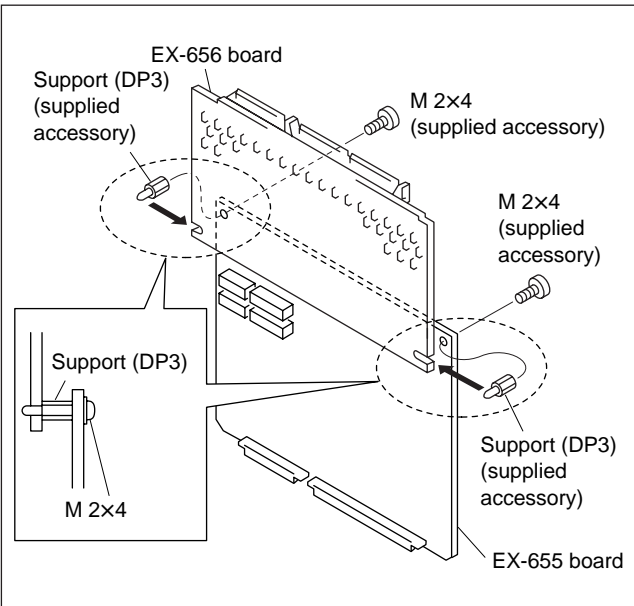
For the side A of the DCP/DVP board assembly check

### Procedure

1. Connect the EX-656 board to the EX-655 board.



2. Slide in the two supplied supports (DP3) between the EX-655 board and the EX-656 board so that the protrusion of the support insert in the slot of the EX-656 board.
3. Secure the supports (DP3) using the two supplied screws from the EX-655 board side.



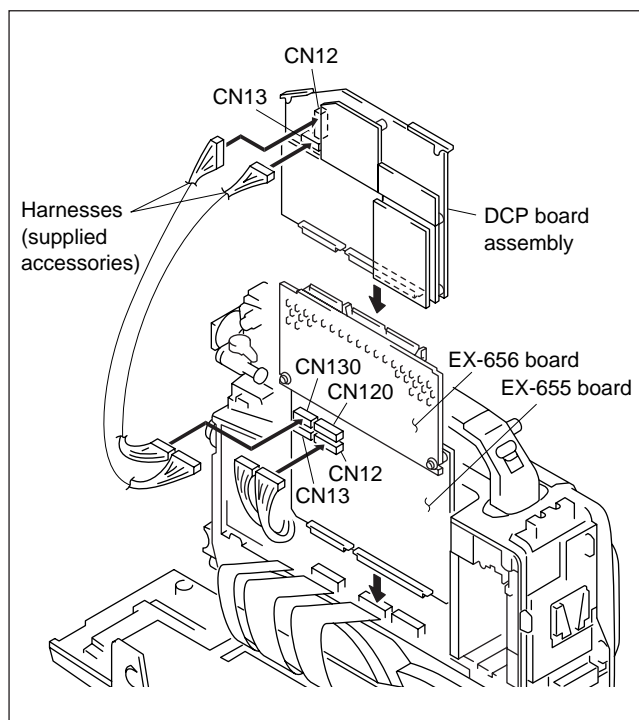


4. Remove the DCP or DVP board assembly to be checked.
5. Insert the EX-655 board into the slot for the DCP or DVP board assembly which is removed in step 4.
6. Connect the DCP or DVP board assembly to the EX-656 board.

### When extending the DCP board assembly

Follow the steps 7 and 8 described below:

7. Reconnect the harnesses removed from the DCP-17 board (CN12 and CN13) to the EX-655 board (CN12 and CN13).
8. Connect the EX-655 board (CN120 and CN130) to the DCP-17 board (CN12, CN13) with the two harnesses supplied.



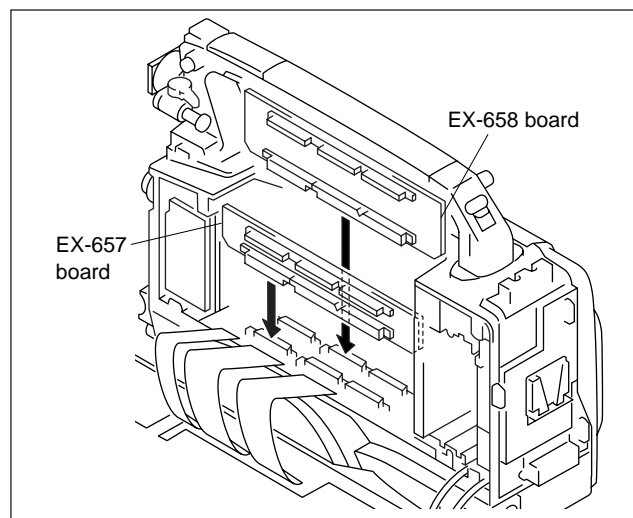
## 1-2-2. Using the EX-657 and EX-658 Boards

These boards are intended for the following use:

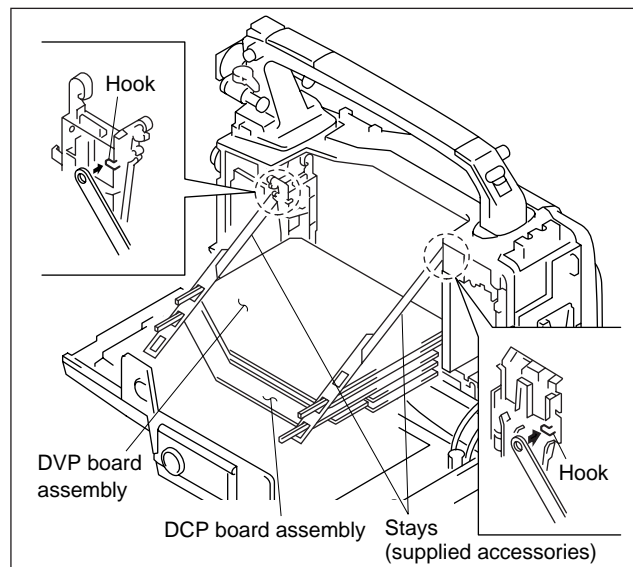
- EX-657 board : For the side B of DCP board assembly check
- EX-658 board : For the side B of DVP board assembly check

### Procedure

1. Pull the DCP and DVP board assemblies out.
2. Insert the EX-657 board into the slot for the DCP board assembly.
3. Insert the EX-658 board into the slot for the DVP board assembly.



4. Connect the DCP board assembly to the EX-657 board.
5. Connect the DVP board assembly to the EX-658 board.
6. Hitch the two supplied stays on the hooks as shown in the figure to support the DCP and DVP board assemblies.



### 1-2-3. Using the EX-667 Board

The EX-667 board is intended for check of the following boards/part:

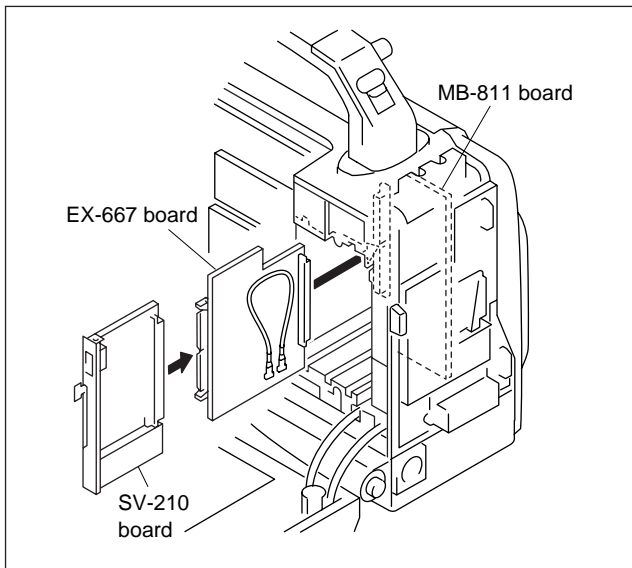
- SV-210 Board
- DC-DC Converter
- DIF-75 Board (BKDW-702)

#### Note

The coaxial cable fixed on the EX-667 board is used for extending the DIF-75 board.

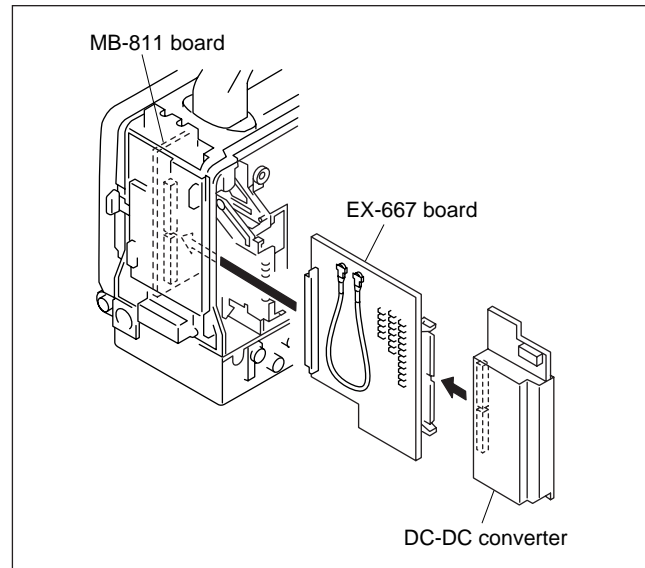
#### SV-210 Board

1. Pull the SV-210 Board out.
2. Insert the EX-667 board into the slot, and then push it to connect the MB-811 board.
3. Connect the SV-210 board to the EX-667 board.



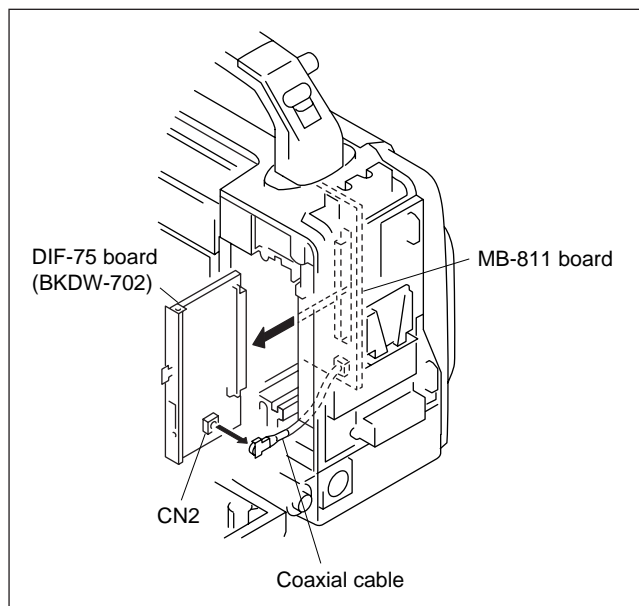
#### DC-DC Converter

1. Pull the DC-DC Converter out.
2. Insert the EX-667 board into the slot, and then push it to connect the MB-811 board.
3. Connect the DC-DC converter to the EX-667 board.

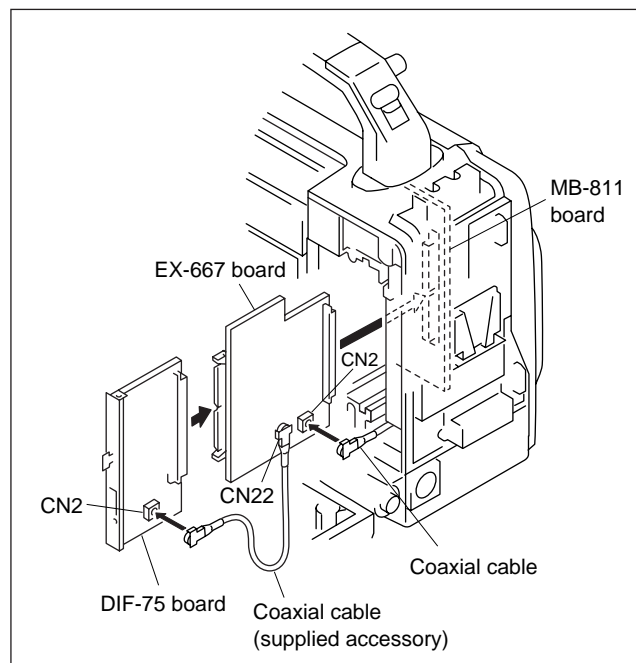


**DIF-75 Board (Optional Board: BKDW-702)**

1. Disconnect the coaxial cable from the connector (CN2) on the DIF-75 board, and then pull the board out.



2. Disconnect the fixed coaxial cable from the connector (CN2) on the EX-667 board.
3. Insert the EX-667 board into the slot, and then push it to connect to the MB-811 board.
4. Reconnect the coaxial cable disconnected in step 1 to the connector (CN2) on the EX-667 board.
5. Engage the DIF-75 board to the EX-667 board.
6. Connect the coaxial cable disconnected from the EX-667 board in step 2 to the connector (CN2) on the DIF-75 board.



### 1-3. Disconnecting/Reconnecting Flexible Card Wires

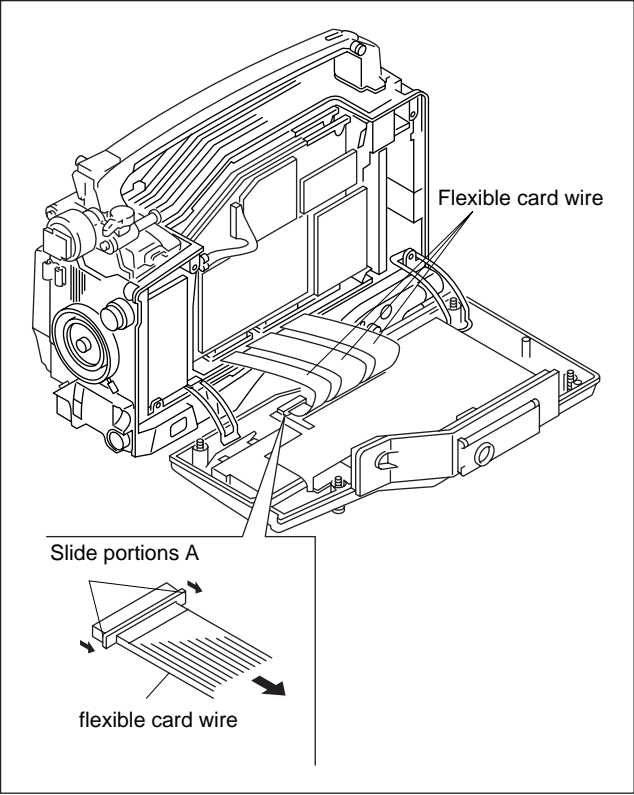
The three flexible card wires are used in the connection of the MB-810 board and the TC-101 board.  
Be careful not to bend forcedly these flexible card wires.  
Crease of wire can seriously shorten its life.

**Note**

Turn off the power, and then unplug the power cord or remove the battery before disconnecting/reconnecting the wires.

#### Disconnecting

1. Slide portions A in the direction of the arrow to unlock the connector, and then pull the flexible card wire out.



#### Reconnecting

1. Check to see that the conductive surface (silver side) of the flexible card wire is not soiled with dust.
2. Slide portions A in the direction of the arrow, and then insert the flexible card wire into the connector with the conductive surface (silver side) down.

**Note**

Be sure to insert the wire straightforward.

3. Slide portions A in the reverse direction to lock the connector.

### 1-4. IC Link

**WARNING**

The IC link is critical for safe operation.  
To avoid danger of a fire or electric shock, be sure use the specified component as a spare part when replacing it.

**CAUTION**

Replacement of the IC link of the plugged-in unit may be hazardous.

Be sure to turn off the power, and then unplug the cord from the DC IN connector before replacing the IC link.

An IC link is mounted on the B side of the HP-93 board.  
This will blow when the overcurrent flows because of internal circuit failure. If it blows, check the circuit for overcurrent after turning off the power.  
And then, replace the IC link with specified part.

| Board | Ref. No. | Description | Part No.     |
|-------|----------|-------------|--------------|
| HP-93 | F1       | IC Link 2A  | 1-533-282-21 |

## 1-5. Notes on CCD Unit

### 1-5-1. Spare CCD Units

The CCD units listed below are available separately.

Order the applicable unit by CCD unit model through a sales channel for the CCD unit replacement.

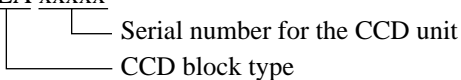
| Camcorder  | CCD unit model   | CCD block type*1 |
|------------|------------------|------------------|
| DVW-790WS  | BKDW-C790W (UCJ) | ILA              |
| DVW-790WSP | BKDW-C790WP (EK) | IMA              |
| DVW-709WS  | BKDW-C709W (UCJ) | IJA              |
| DVW-709WSP | BKDW-C709WP (EK) | IKA              |
| DVW-707    | BKDW-C707 (UCJ)  | INA              |
| DVW-707P   | BKDW-C707P (EK)  | IOA              |

\*1 : As for the detail on the CCD block type, refer to Section 1-5-2.

### 1-5-2. Description on CCD Block Number

Every CCD unit has its own ID number called CCD block number. It shows the CCD block type and serial number for the CCD block.

The CCD block number label is put in the CCD unit.

Example : ILA xxxxx  


As for the procedure for replacing the CCD unit, refer to Section “3-2-1. Replacing the CCD Unit”.

## 1-6. Description on EEPROM/NV-RAM Data

The table below gives the stored data of EEPROMs/NV-RAM on the printed circuit boards:

| Board  | Ref. No.   | EEPROM/NV-RAM | Stored data                  | Reference   |
|--------|------------|---------------|------------------------------|-------------|
| DCP-17 | IC152 (C3) | NV-RAM        | All value of setup menu      | Section 1-7 |
|        | IC140 (D5) | EEPROM        | Special gamma table data     | Section 1-7 |
| ES-23  | IC18 (B2)  | EEPROM        | Board adjustment data        | Section 1-8 |
| IF-716 | IC102 (D4) | EEPROM        | Model name and serial number | --          |

#### Notes

- The part numbers of these ICs which data is blank or factory-set are specified in “Section 1. Spare Parts” of the Maintenance Manual Part 2 Vol.2.
- As for the IC102 on the IF-716 board, it is impossible to write the original data into the new IC.  
When replacing the IF-716 board, remove the IC102 on the new IF-716 board and replace with the used IC on the former board.  
If it becomes necessary to replace with a new IC, contact your local Sony Service Center/Sales Office.

## 1-7. Note on the DCP-17 Board Replacement

### EEPROM/NV-RAM

#### CAUTION

Operation of the unit elevates the temperature of the IC package. Heated IC package may result in injury. Replace the IC after turning off the power and ample time for the IC to cool off.

The EEPROM (IC123) and NV-RAM (IC140) on the DCP-17 board store data which was written by the customer. When replacing them with a new ICs, the former data is reset to the factory setting.

If necessary, remove the IC123/IC140 on the former DCP-17 board, and then reattach it to the new board.

| Ref. No. (Address) | Data stored  |
|--------------------|--|
| IC152 (C3/DCP-17)  | Whole settings of the setup menu (User-written, and service engineer-written settings*1) |
| IC140 (D5/DCP-17)  | Special gamma table data*2 (User-written setting)  |

\*1 : Refer to Section "3-1. Engineer Mode (Setup Menu)" in the Maintenance Manual Part 1 to re-set the engineer mode.

\*2 : If your customer does not use the special gamma, it is not necessary to replace the IC140.

### Setting/Adjustment After Board Replacement

Refer to the following sections to set/adjust the DCP-17 board after replacing.

- Maintenance Manual Part 1 "1-10-3. DCP-17 Board"
- "Section 7\*1 or 8\*2. Camera System Electrical Adjustments"

\*1 : For DVW-790WS/790WSP/709WS/709WSP only

\*2 : For DVW-707/707P only

## 1-8. EEPROM on the ES-23 Board

#### CAUTION

Operation of the unit elevates the temperature of the IC package. Heated IC package may result in injury. Replace the IC after turning off the power and ample time for the IC to cool off.

The EEPROM (IC18) on the ES-23 board store the following data.

| Ref. No. (Address) | Data stored                               |
|--------------------|---|
| IC18 (B2/ES-23)    | Adjustment data (encoder factory setting) |

#### Note

The part number of IC which is not adjusted is specified in the Section 1. Spare Parts List in the Maintenance Manual Part 2 Vol.2.

If the IC18 is replaced with a new IC of this part number, follow the steps below to re-set the data.

In case of the ES-23 board replacement, it is not necessary to re-set data of the IC18 because its board is factory-adjusted.

### Adjusting After EEPROM Replacement

1. Enter the service mode. (Refer to the following steps (1) to (3).)
  - (1) Turn off the power.
  - (2) Turn on the switch S4-1 on the DCP-17 board.
  - (3) Turn on the POWER switch.
2. Perform the following camera system electrical alignments.
  - ENC OUT Adjustment (Refer to Section 7-4\*1 or 8-4\*2.)
  - TEST OUT Level Adjustment (Refer to Section 7-5\*1 or 8-5\*2.)

\*1 : For DVW-790WS/790WSP/709WS/709WSP only

\*2 : For DVW-707/707P only

## 1-9. Note on the IF-716 Board Replacement

### CAUTION

Operation of the unit elevates the temperature of the IC package. Heated IC package may result in injury. Replace the IC after turning off the power and ample time for the IC to cool off.

The EEPROM (IC102) on the IF-716 board store the following data.

| Ref. No. (Address) | Data stored          |
|--------------------|----------------------|
| IC102 (D4/IF-716)  | Model and Serial No. |

### Note

As for the IC102 on the IF-716 board, it is impossible to write the original data into a new IC.  
 When replacing the IF-716 board, remove the IC102 on the new IF-716 board and replace with the used IC on the former board.  
 If it becomes necessary to replace with a new IC, contact your local Sony Service Center/Sales Office.

## 1-10. Note on the RE-160 and RE-161 Boards

The RE-160 and RE-161 boards and electrical parts mounted on its boards cannot be replaced.  
 If these parts are out of order, replace the whole DC-DC converter.

## 1-11. DC Fans Precaution

The bearing of the DC fan is a precision part. Be careful not to grasp the fan by its blade, bump, and drop it. Unduly shock may damage the bearing in the fan, that can result in abnormal noise during the fan operation.

## 1-12. Setting/Adjusting After Board Replacements

The boards required setting/adjusting after replacement are as follows :

| Board    | Setting/Adjusting after Replacement  |
|----------|--|
| AD-155   | 7-8./8-8. R/B AD Gain Adjustment   |
| AXM-21   | Switch/Slit land settings<br>(Refer to the MM P1*1, Section 1-10-1.)   |
| CNB-11   | Slit land settings<br>(Refer to the MM P1*1, Section 1-10-2.)  |
| DCP-17   | Switch settings<br>(Refer to the MM P1*1, Section 1-10-3.)<br>Section 7./8. Camera System Electrical Alignment<br>(when very good accuracy is required)            |
| DVP-17   | Switch settings<br>(Refer to the MM P1*1, Section 1-10-4.)<br>6-5-2. Playback Equalizer Adjustment,<br>6-5-3. REC Current Automatic Adjustment                     |
| ES-23    | 7-2./8-2. VCO CONT Frequency Check   |
| IF-716   | Replace the IC102 with the used one on the former board.   |
| TC-101   | Switch settings<br>(Refer to the MM P1*1, Section 1-10-6.)<br>6-2-1. Battery End Detection Voltage Adjustment  |
| TG-206*2 | 8-2. VCO CONT Frequency Check  |
| TG-207*3 | Switch settings<br>(Refer to the MM P1*1, Section 1-10-7.)   |
| VA-191   | 7-8./8-8. R/B AD Gain Adjustment   |
| CCD unit | 5-1. Tape Path Alignment<br>7-2./8-2. VCO CONT Frequency Check<br>7-3./8-3. AD Clock Phase Adjustment<br>MM P1*1 Section 4./5. Camera Sysytem Electrical Alignment |

\*1 : Maintenance Manual Part 1

\*2 : For DVW-707/707P only

\*3 : For DVW-790WS/790WSP/709WS/709WSP only





## Section 2

# Setup Menu

This section describes the service mode that is part of the Setup Menu which appears on the viewfinder screen. For the VTR menu, refer to the Maintenance Manual, Part 1, Section 3-2.

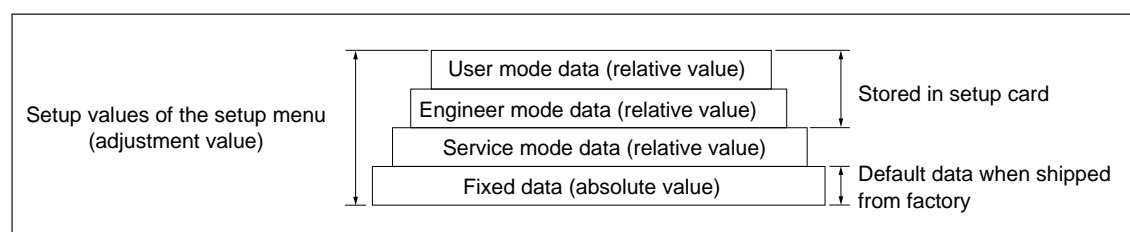
### 2-1. Service Mode

The circuit boards that are supplied as repair parts have already been adjusted before shipment from the factory. However, the adjustment values somewhat differ for each product. After replacing any of the circuit boards relating to the video signal of the camera, use the service mode to perform accurate adjustment.

#### Data Structure

Data structure of the setup menu is described as shown below.

Setup values of the setup menu = Fixed data (absolute value) + Service mode setup value (relative value) + Engineer mode setup value (relative value) + User mode setup value (relative value)



- When any item is adjusted using the service mode, the adjustment value of that item in the engineer mode and that in the user mode are returned to 0.
- The fixed data has been stored in IC15 on the DR-387 board, IC140 on the DCP-17 board and IC18 on the ES-23 board respectively. The set values in the user, engineer and service modes are stored in IC123 on the DCP-17 board.
- The set values in the user, engineer and service modes have been set to 0 when the unit is shipped from the factory.
- Refer to the Operation Manual and Maintenance Manual, Part 1, Section 3 for the user mode and the engineer mode.
- When the RM-B150/P9 remote control is connected to operate the system externally, there are some items whose set values cannot be changed or to which set values are not reflected. Refer to Section 2-1-3, “Setup Menu List” for details.

#### How to Return the Set Values of Each Mode to the Default Values

The set values of each mode can be returned to the default values using the setup menu.

Refer to the items on the DATA RESET page in Section “2-1-2 Contents of Setup Menu” for details.

#### About the Setup Card

- When a setting is saved in a setup card, the set value in the user mode and that in the engineer mode are stored separately.
- The fixed data differs for each product. When the same setup card is used for the camera adjustment using the service mode before and after replacing the board or for adjusting multiple cameras, the same fixed data and the same setup data in the service mode can be obtained.  
Therefore, the desired value should be set using a typical camera as the reference camera in both the user mode and engineer mode, and the value should be saved in a setup card. When a board is replaced or other cameras are to be matched, adjust the camera in the service mode first, then download the data that has been saved in the setup card, to the camera.

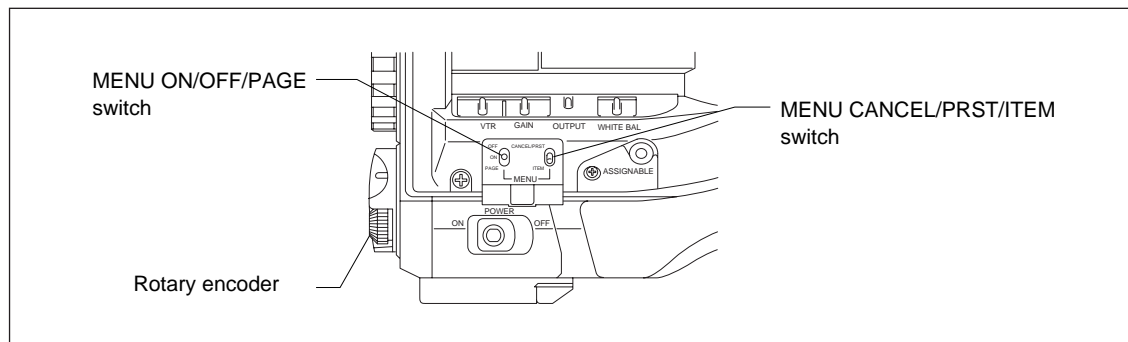
#### How to Enter the Service Mode

When the MENU/ON/OFF switch has been set to the ON position during normal operation after the main power is turned on, the camera enters the user mode. To make the camera enter the service mode, set the following switch, turn on the main power and then set the MENU/ON/OFF switch to the ON position.

S4-1/DCP-17 board → ON

## 2-1-1. Fundamental Operation of the Setup Menu

### Switch description



#### 1. MENU ON/OFF/PAGE switch

The MENU ON/OFF/PAGE switch is used to display the setup menu or to switch the display items in units of page. When lid is closed, the MENU ON/OFF/PAGE switch is automatically set to the OFF position.

ON : Displays the setup menu.

OFF : Exits from the setup menu.

PAGE : Selects another page of the setup menu

#### 2. MENU CANCEL/PRST/ITEM switch

The MENU CANCEL/PRST/ITEM switch is used to select the desired item or to cancel setting or to recover the default setting when the MENU ON/OFF/PAGE switch is ON.

CANCEL/PRST : Cancels the already executed setting, or returns to the default setting.

ITEM : Selects the desired item.

#### 3. Rotary encoder

Rotate: Moves to another page or to another item, or to change the setup value.

Press: Sets the page, or enters the setup value modification mode.

### Operation (Using the MENU switch)

1. Set the MENU ON/OFF/PAGE switch to ON position.
2. To move to another page, set the MENU ON/OFF/PAGE switch to PAGE. (Moves to the next page every time when this switch is set.)
3. To move to another item, set the MENU CANCEL/PRST/ITEM switch to ITEM. (The cursor moves to the next item every time when this switch is set.)  
Press the rotary encoder to enter the setup value modification mode.
4. Rotate the rotary encoder to modify the setup value.
5. To exit from the setup menu, turn OFF the MENU ON/OFF/PAGE switch.

### Operation (Using the rotary encoder)


























1. Set the MENU ON/OFF/PAGE switch to ON position.
2. To move to another page, rotate the rotary encoder. (A page is set by pressing the rotary encoder.)
3. To move to another item, rotate the rotary encoder. (An item is set by pressing the rotary encoder.)  
Press the rotary encoder to enter the setup value modification mode.
4. To modify the setup value, rotate the rotary encoder.
5. To exit from the setup menu, turn OFF the MENU ON/OFF/PAGE switch.

## 2-1-2. Contents of Setup Menu

This section describes all menu items that appear when the service mode is selected.

(The items shown in halftone  appear only in the service mode.)

(Values in square  of the Setup column indicate the default value when shipped from factory.)

| No. | Page        | Item             | Setup   | Description   |
|-----|-------------|------------------|---|---|
| 1   | MARKER 1/3  | SAFETY ZONE      |  ON/       | OFF Sets the safety zone marker display to ON or OFF.   |
|     |             | SAFETY AREA      | 80%/  90%/ | 100% Sets the safety zone area to 80 %, 90 % or 100 %.  |
|     |             | CENTER           | ON/  OFF   | Sets the center marker display to ON to OFF.  |
|     |             | CENTER H         | X (  )     | Moves the center marker horizontally.   |
|     |             | CENTER V         | X (  )     | Moves the center marker vertically.   |
| 2   | MARKER 2/3  | BOX CURSOR       | ON/  OFF   | Sets the box cursor display to ON or OFF.<br><br>Note : The box cursor does not appear in the following cases.<br>The WIDE SCREEN page BOX/4:3/14:9 LIMIT is set to any other item than BOX.<br>The WIDE SCREEN page BOX/4:3/14:9 MODE is set to 4:3, while the VF ASPECT is set to 16:9A or 16:9B. |
|     |             | BOX WIDTH        | X (  )     | Changes the width of the box cursor.  |
|     |             | BOX HEIGHT       | X (  )     | Changes the height of the box cursor.   |
|     |             | BOX H            | X (  )     | Moves the box cursor horizontally.  |
|     |             | BOX V            | X (  )   | Moves the box cursor vertically.  |
| 3   | MARKER 3/3  | TEST OUT MIX     | ON/  OFF | Turns ON/OFF the function of outputting the VF marker to TEST OUT.  |
|     |             | RET MIX          | ON/  OFF | Turns ON/OFF the function of mixing the VF marker with return video.  |
|     |             | TEST OUT VF DISP | ON/  OFF | Turns ON/OFF the function of outputting the character to TEST OUT where the character is displayed on VF when the VF DISPLAY switch is set to ON.   |
|     |             | TEST OUT MENU    | ON/  OFF | Turns ON/OFF the function of outputting the menu to TEST OUT where the menu is displayed on VF when the MENU ON/OFF/PAGE switch is set to ON.<br><br>Note : When an RM is connected, the menu is forced to be outputted regardless of this menu setting.  |
|     |             | RM VF MENU INH.  |  ON/     | OFF ON : The menu is not displayed even through the MENU switch is set to ON when an RM is connected.<br><br>OFF : The menu is displayed when the MENU switch is set to ON even though an RM is connected.  |
| 4   | VF DISP 1/2 | DISP MODE        | 1/2/  3  | Set the display mode. (For details, refer to the Operation Manual.)   |
|     |             | EXTENDER         |  ON/     | OFF Sets the extender display to ON or OFF.   |
|     |             | ZOOM             |  ON/     | OFF Sets the zoom position display to ON or OFF.  |
| 5   | VF DISP 2/2 | FILTER           |  ON/     | OFF Sets the filter display to ON or OFF.   |
|     |             | WHITE            |  ON/     | OFF Sets the white balance display to ON or OFF.  |
|     |             | GAIN             |  ON/     | OFF Sets the gain selection value display to ON or OFF.   |
|     |             | SHUTTER          |  ON/     | OFF Sets the shutter speed/mode display to ON or OFF.   |
|     |             | TAPE             |  ON/     | OFF Sets the tape remaining display to ON or OFF.   |
|     |             | AUDIO            |  ON/     | OFF Sets the CH-1 audio level display to ON or OFF.   |
|     |             | IRIS             |  ON/     | OFF Sets the iris value display to ON or OFF.   |

| No. | Page        | Item                       | Setup                                    | Description  |
|-----|-------------|----------------------------|--|--|
| 6   | MASTER GAIN | LOW                        | −3/[0]/3/6/9/12/18/<br>24/30/36/42/48 dB | Sets the gain corresponding to the LOW, MIDDLE, HIGH and TURBO positions of the GAIN selector switch.  |
|     |             | MID                        | −3/0/3/6/[9]/12/18/<br>24/30/36/42/48 dB | Note : When the gain selection value is changed, the BLACK SET adjustment is required.   |
|     |             | HIGH                       | −3/0/3/6/9/12/[18]/<br>24/30/36/42/48 dB |  |
|     |             | TURBO                      | −3/0/3/6/9/12/18/<br>24/30/36/[42]/48 dB |  |
| 7   | SHOT ID     | ID-1                       |  | Shot ID setting (ID1 to ID4)   |
|     |             | ID-2                       |  | Sets the shot ID of a maximum of twelve characters using alphanumeric character, symbol, and space.  |
|     |             | ID-3                       |  |  |
|     |             | ID-4                       |  |  |
| 8   | SHOT DISP   |                            |  | Selects the shot data to be super-imposed on color-bar signal.   |
|     |             | DATE                       | ON/[OFF]                                 | Date   |
|     |             | TIME                       | ON/[OFF]                                 | Time   |
|     |             | MODEL NAME                 | ON/[OFF]                                 | Model name   |
|     |             | SERIAL NO.                 | ON/[OFF]                                 | Serial No.   |
|     |             | CASSTTE NO.                | ON/[OFF]                                 | Cassette No.   |
|     |             | SHOT NO.                   | ON/[OFF]                                 | Shot No.   |
|     |             | ID SELECT                  | [OFF]/ID1/ID2/<br>ID3/ID4                | The shot ID number that is selected by the SHOT ID page.   |
| 9   | SHUTTER     |                            |  | The shutter mode/speed setting that can be selected by the SHUTTER switch, etc.  |
|     |             | EVS                        | [ON]/OFF                                 | Turns ON/OFF the EVS mode. (DVW-709WS/709WSP/707/707P)<br>Turns ON/OFF the super EVS (Enhanced vertical definition) mode. (DVW-790WS/790WSP) |
|     |             | CLS                        | [ON]/OFF                                 | Turns ON/OFF the CLS (clear scan) mode. (DVW-709WS/709WSP/707/707P)<br>Turns ON/OFF the ECS (extended clear scan) mode. (DVW-790WS/790WSP)   |
|     |             | 1/100 (NTSC)<br>1/60 (PAL) | [ON]/OFF                                 | Shutter speed 1/100 (for NTSC) or 1/60 (for PAL) second in the standard mode   |
|     |             | 1/125                      | [ON]/OFF                                 | Shutter speed 1/125 second in the standard mode  |
|     |             | 1/250                      | [ON]/OFF                                 | Shutter speed 1/250 second in the standard mode  |
|     |             | 1/500                      | [ON]/OFF                                 | Shutter speed 1/500 second in the standard mode  |
|     |             | 1/1000                     | [ON]/OFF                                 | Shutter speed 1/1000 second in the standard mode   |
|     |             | 1/2000                     | [ON]/OFF                                 | Shutter speed 1/2000 second in the standard mode   |
| 10  | ! LED       |                            |  | OFF : The “!” lamp of VF does not turn on.<br>ON : The “!” lamp of VF turns on when the following conditions are satisfied.                  |
|     |             | MASTER GAIN                | [ON]/OFF                                 | The GAIN value is set to any value other than 0 dB.  |
|     |             | SHUTTER ON                 | [ON]/OFF                                 | The SHUTTER switch is set to ON.   |
|     |             | WHITE PRESET               | ON/[OFF]                                 | The WHITE BAL switch is set to PRST.   |
|     |             | ATW RUN                    | ON/[OFF]                                 | The ATW (automatic tracing white balance) is operating.  |
|     |             | EXTENDER ON                | [ON]/OFF                                 | Lens extender is being used.   |
|     |             | FILTER 2,3,4               | ON/[OFF]                                 | Filter is set to any position other than 1.  |
|     |             | FILTER A,C,D               | ON/[OFF]                                 | Filter is set to any position other than B. (DVW-790WS/790WSP/709WS/709WSP only)   |
|     |             | A.IRIS OVERRIDE            | ON/[OFF]                                 | Reference value of the automatic iris control is et to any value other than the standard value.  |

| No. | Page         | Item            | Setup  | Description  |
|-----|--------------|-----------------|--|--|
| 11  | SETUP CARD   | READ (→CAM)     | To be executed by pressing the rotary encoder.       | Reads data from the setup card.  |
|     |              | WRITE (→CARD)   | To be executed by pressing the rotary encoder.       | Writes data to the setup card  |
|     |              | ID EDIT         |  | The card ID can be set within ten characters using alphanumeric characters and symbols.  |
|     |              | WRITE PROTECT   | ON/ <input type="checkbox"/> OFF                     | Turns ON/OFF the write-inhibit function into the setup card.   |
|     |              | WHITE DATA      | ON/ <input type="checkbox"/> OFF                     | Turns ON/OFF the function of reading white balance correction value from the setup card.   |
| 12  | FUNCTION 1/2 | TEST OUT        | <input type="checkbox"/> ENC/R/G/B                   | Selection of video signal to be output froth TEST OUT connector.<br>Note : R-G or B-G can be selected when R-G/B-G SEL on the first page of OPERATION is set to ON.  |
|     |              | DETAIL          | <input type="checkbox"/> ON/OFF                      | Turns ON/OFF the function of adding detail signal to video for improving resolution power.   |
|     |              | APERTURE        | <input type="checkbox"/> ON/OFF                      | Sets the aperture correction to ON or OFF.   |
|     |              | SKIN TONE DTL   | ON/ <input type="checkbox"/> OFF                     | Turns ON/OFF the skin tone detail function.  |
|     |              | MATRIX          | ON/OFF<br>※Default value<br>OFF (J)<br>ON (Except J) | Turns ON/OFF the linear matrix correction function.<br>The highly color saturation can be obtained when this item is set to ON.  |
|     |              | GAMMA           | <input type="checkbox"/> ON/OFF                      | Turns ON/OFF the gamma correction function.  |
|     |              | BLACK GAMMA     | ON/ <input type="checkbox"/> OFF                     | Turns ON/OFF the black gamma correction function.  |
|     |              | CHROMA          | <input type="checkbox"/> ON/OFF                      | Turns ON/OFF the function to add chroma signal.  |
|     |              | TEST SAW        | ON/ <input type="checkbox"/> OFF                     | Turns ON/OFF the function to add the TEST signal to the video signal system forcibly. (Used during the video signal adjustment.)   |
|     |              | CROSS COLOR FLT | ON/ <input type="checkbox"/> OFF                     | Turns ON/OFF the function to reduce the cross-color of video signal. (NTSC only)   |
|     |              | GENLOCK         | <input type="checkbox"/> ON/OFF                      | Turns ON/OFF the function of synchronizing the internal reference signal with the video signal that is input to GENLOCK IN connector.  |
|     |              | CAM RET.        | ON/ <input type="checkbox"/> OFF                     | Turns ON/OFF the function of displaying the return video signal that is input to the GENLOCK IN connector, when the RET button on the lens is set to ON.   |
| 13  | FUNCTION 2/2 | FILTER INH.     | ON/ <input type="checkbox"/> OFF                     | Turns ON/OFF the function of interlocking the filter with the white balance correction value.<br><br>ON : The white balance correction value does not interlock with the color temperature conversion filter, but is memorized in the memory A and memory B respectively.<br><br>OFF : The white balance correction value is memorized in the respective memories of memory A (4 memories) and memory B (4 memories) totaling 8 memories respectively. |
|     |              | FIELD/FRAME     | <input type="checkbox"/> FIELD/FRAME                 | Sets the CCD read-out method.<br><br>FIELD : Reading out in units of field. (Normal setting)<br><br>FRAME : Reading out in units of frame.<br>(Used when the higher vertical resolution is desired)<br><br>Note : The FRAME reading has a more residual image than the FIELD reading.  |
|     |              | A.IRIS OVERRIDE | ON/ <input type="checkbox"/> OFF                     | Turns ON/OFF the iris override function.<br><br>When the iris override function is set to ON, reference value of the AUTO iris adjustment can be modified by the rotary encoder when the MENU ON/OFF/PAGE switch is set to OFF.<br>(5 steps: -1/2, -1/4, 0, +1/4, +1/2 steps of iris stop)   |
|     |              |                 |  |  |
|     |              |                 |  |  |

(continued)

| No. | Page         | Item                | Setup  | Description  |
|-----|--------------|---------------------|--|--|
| 13  | FUNCTION 2/2 | DCC FUNCTION SEL    | FIX/ <input type="checkbox"/> DCC/ADP.K                          | <p>Selects the DCC function modes when the DCC switch is set to ON.</p> <p>DCC : Normal mode<br/>(Dynamic range is set by the DCC ADJUSTMENT page.)</p> <p>FIX : Knee is corrected by the fixed dynamic range of 600%.</p> <p>ADP.K : Adaptive mode<br/>Detects an object which is occupying the largest area of a picture and automatically adjusts the knee point and knee slope to obtain the optimum level for the object.</p>   |
|     |              | REAR BNC OUT        | <input type="checkbox"/> VBS/SDI/OFF                             | <p>Selects the signal to be output from the rear panel VIDEO OUT connector when the SDI output board BKDW-702 is installed.</p> <p>VBS : Outputs the composite video signal.</p> <p>SDI : Outputs the SDI signal.</p> <p>OFF : Set to OFF when power saving is desired.</p>  |
|     |              | VTR MODE            | ON/ <input type="checkbox"/> OFF                                 | <p>Set to ON when an external VTR is controlled by the VTR START button as it is interlocked with the DVW, when an external VTR is connected via the CA-702.</p>   |
|     |              | REC INHIBIT         | <input type="checkbox"/> ON/OFF                                  | <p>Set to OFF when you use a built-in VTR for recording even though CCU is connected via CA-705/755.</p> <p>Note : When this setup is set to OFF, a viewfinder can not be powered on.</p>  |
|     |              | ASSIGNABLE SW       | <input type="checkbox"/> OFF/RET/REC/TURBO/AUDIO/ATW/LOOPR/F.SHT | <p>Selects function of the ASSINABLE button.</p> <p>OFF : No function assigned</p> <p>RET : RET button</p> <p>REC : VTR START button</p> <p>TURBO : TURBO GAIN button</p> <p>AUDIO : The ON/OFF switch of the function to display the AUDIO source on VF for each channel.</p> <p>ATW : The ON/OFF switch of the ATW function</p> <p>LOOPR : The ON/OFF switch of the loop recording function.<br/>(This item is displayed only when the picture cache board BKDW-703 is installed.)</p> <p>F. SHT : The ON/OFF switch of the frame shutter function.<br/>(This item is displayed only when the frame shutter unit BKDW-705 is installed.)</p> |
| 14  | WIDE SCREEN  |                     |  | <p>Note : This page is displayed only in DVW-790WS/790WSP/709WS/709WSP only</p>  |
|     |              | 16:9/4:3 MODE       | <input type="checkbox"/> 16:9/4:3                                | <p>Sets the aspect ratio of the video signal output from the VIDEO OUT and TEST OUT connectors.</p>  |
|     |              | VF ASPECT           | <input type="checkbox"/> AUTO/4:3/16:9A/16:9B                    | <p>Sets the aspect ratio on the viewfinder.</p> <p>AUTO : Sets the aspect ratio set by 16:9/4:3 MODE setting.</p> <p>4:3 : Sets the aspect ratio to 4:3 regardless of 16:9/4:3 MODE setting.</p> <p>16:9A : Sets the aspect ratio to 16:9 regardless of 16:9/4:3 MODE setting (displays the area of 4:3 mode with the marker).</p> <p>16:9B : Sets the aspect ratio to 16:9 regardless of 16:9/4:3 MODE setting (video level is cut in half out of the safety zone area on the VF screen).</p>   |
|     |              | BOX/4:3/14:9 LIMITS | <input type="checkbox"/> BOX/4:3/14:9                            | <p>Sets the function of the box cursor.</p> <p>BOX : Operates as the normal cursor function.</p> <p>4:3 : Displays the 4:3 area when the 16:9/4:3 MODE set to 16:9.</p> <p>14:9 : Displays the 14:9 area when 16:9 is selected by the above described 16:9/4:3 MODE.</p>   |
|     |              | 16:9 BARS ID        | ON/ <input type="checkbox"/> OFF                                 | <p>Turns ON/OFF the function of adding the 16:9 display to the built-in color bar when 16:9 is selected by the above described 16:9/4:3 MODE.</p>  |
|     |              | 16:9 VF ID          | ON/ <input type="checkbox"/> OFF                                 | <p>Turns ON/OFF the function of adding the 16:9 display to the VF screen when 16:9 is selected by the above described 16:9/4:3 MODE.</p>   |

| No. | Page        | Item   | Setup  | Description   |
|-----|-------------|--|--|---|
| 15  | VF SETTING  | ZEBRA 1 DETECT   | 20 to 107 % ( <input type="text" value="70"/> )  | Sets the center level of the zebra 1 pattern.   |
|     |             | ZEBRA 1 APERTURE   | 1 to 20 % ( <input type="text" value="10"/> )    | Sets the width of the zebra 1 pattern.  |
|     |             | ZEBRA 2 DETECT   | 52 to 109 % ( <input type="text" value="100"/> ) | Sets the ZEBRA2 display level.  |
|     |             | ZEBRA SELECT   | <input type="text" value="1"/> /2/BOTH           | Selects the zebra patterns.   |
|     |             | TEST OUT ZEBRA   | ON/ <input type="text" value="OFF"/>             | Turns ON/OFF the function of outputting the zebra pattern to TEST OUT.                              |
|     |             | VF DTL LEVEL   | X ( <input type="text" value="0"/> )             | Sets the VF detail amount.  |
| 16  | LEVEL 1     | DETAIL LVL   | X ( <input type="text" value="0"/> )             | Sets the total level of the detail signal.  |
|     |             | H/V RATIO  | X ( <input type="text" value="0"/> )             | Sets balance between the H detail signal and the V detail signal.                                   |
|     |             | DTL FREQ   | X ( <input type="text" value="0"/> )             | Sets frequency (thickness) of the H detail signal.  |
|     |             | CRISPENING   | X ( <input type="text" value="0"/> )             | Sets the crispening level of the detail signal.   |
|     |             | APT. LEVEL   | X ( <input type="text" value="0"/> )             | Sets the high-frequency correction level.   |
|     |             | DTL W.CLP  | X ( <input type="text" value="0"/> )             | Sets the white clip level of the V detail signal.   |
|     |             | DTL V B.CLP  | X ( <input type="text" value="0"/> )             | Sets the level that clips the excessive level in the negative (–) direction of the V detail signal. |
|     |             | DTL H B.CLP  | X ( <input type="text" value="0"/> )             | Sets the level that clips the excessive level in the negative (–) direction of the H detail signal. |
|     |             | LVL DEPEND   | <input type="text" value="ON"/> /OFF             | Turns ON/OFF the level dependent function   |
| 17  | LEVEL 2     | L.DEP.LVL  | X ( <input type="text" value="0"/> )             | Sets the level that suppresses the detail signal at the low signal level.                           |
|     |             | KNEE APT   | ON/ <input type="text" value="OFF"/>             | Turns ON/OFF the knee aperture function.  |
|     |             | K.APT.LVL  | X ( <input type="text" value="0"/> )             | Adjusts the detail signal amount that is added to the high light signal higher than the knee point. |
|     |             | DTL COMB   | X ( <input type="text" value="0"/> )             | Set the signal level at which the comb filter starts working.                                       |
|     |             | C.C.S.LVL  | X ( <input type="text" value="0"/> )             | Sets the chroma suppression level. (NTSC only)  |
| 18  | LEVEL 1#4:3 | Note : This page is displayed only in DVW-790WS/790WSP/709WS/709WSP.<br>The following settings are valid when the 16:9/4:3 MODE on the WIDE SCREEN is set to 4:3.  |  |   |
|     |             | DETAIL LVL   | X ( <input type="text" value="0"/> )             | Sets the overall level of the detail signal.  |
|     |             | H/V RATIO  | X ( <input type="text" value="0"/> )             | Sets balance between the H detail signal and the V detail signal.                                   |
|     |             | DTL FREQ   | X ( <input type="text" value="0"/> )             | Sets frequency (thickness) of the H detail signal.  |
|     |             | CRISPENING   | X ( <input type="text" value="0"/> )             | Sets the crispening level of the detail signal.   |
|     |             | APT. LEVEL   | X ( <input type="text" value="0"/> )             | Sets the high frequency correction level.   |
|     |             | DTL W.CLP  | X ( <input type="text" value="0"/> )             | Sets the white clip level of the V detail signal.   |
|     |             | DTL V B.CLP  | X ( <input type="text" value="0"/> )             | Sets the level that clips the excessive level in the negative (–) direction of the V detail signal. |
|     |             | DTL H B.CLP  | X ( <input type="text" value="0"/> )             | Sets the level that clips the excessive level in the negative (–) direction of the H detail signal. |
|     |             | LVL DEPEND   | <input type="text" value="ON"/> /OFF             | Turns ON/OFF the level dependent function   |
|     |             | L.DEP.LVL  | X ( <input type="text" value="0"/> )             | Sets the level that suppresses the detail signal at the low signal level.                           |
| 19  | LEVEL 2#4:3 | Note : This page is displayed only in DVW-790WS/790WSP/709WS/709WSP.<br>The following settings are valid when the 16:9/4:3 MODE on the WIDE SECREEN is set to 4:3. |  |   |
|     |             | KNEE APT   | ON/ <input type="text" value="OFF"/>             | Turns ON/OFF the knee aperture function.  |
|     |             | K.APT.LVL  | X ( <input type="text" value="0"/> )             | Adjusts the detail signal amount that is added to the high light signal higher than the knee point. |
|     |             | DTL COMB   | X ( <input type="text" value="0"/> )             | Set the signal level at which the comb filter starts working.                                       |
|     |             | C.C.S.LVL  | X ( <input type="text" value="0"/> )             | Sets the chroma suppression level. (NTSC only)  |

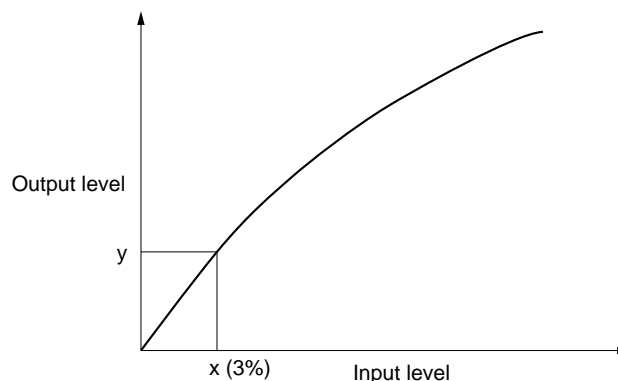


| No. | Page    | Item                                 | Setup  | Description   |
|-----|---------|--------------------------------------|--|---|
| 20  | LEVEL 3 | SKIN TONE DTL                        | ON/ <input type="checkbox"/> OFF                               | Turns ON/OFF the skin tone detail function.<br>(Same as the TEST OUT on the 1/2 pages of FUNCTION.)   |
|     |         | SUPPRESS LEVEL                       | X( <input type="checkbox"/> )                                  | Sets signal amount of the skin tone detail.   |
|     |         | SKIN TONE DET                        | <input type="checkbox"/> OFF/EXEC                              | Sets to the EXEC position when the range in which skin tone detail function is automatically set.<br>(Shoot a skin tone object that fills the entire gate marker on VF, and press the rotary encoder.)  |
|     |         | SATURATION                           | X( <input type="checkbox"/> )                                  | Sets the range of color saturation in which the skin tone detail function works.  |
|     |         | HUE                                  | X( <input type="checkbox"/> )                                  | Sets the range of color hue in which the skin tone detail function works.   |
|     |         | WIDTH                                | X( <input type="checkbox"/> )                                  | Sets the width of color hue in which the skin tone detail function works.   |
|     |         | SKIN AREA IND.                       | ON/ <input type="checkbox"/> OFF                               | Turns ON/OFF the function of displaying zebra pattern on VF indicating the range detecting the skin tone detail.  |
| 21  | LEVEL 4 | MASTER BLACK                         | X( <input type="checkbox"/> )                                  | Adjusts the master black level.   |
|     |         | MASTER GAMMA                         | X( <input type="checkbox"/> )                                  | Adjusts the master gamma correction curve.  |
|     |         | MASTER BLACK GAMMA                   | X( <input type="checkbox"/> )                                  | Adjusts the master black gamma.<br>It sets the rise-up of the gamma correction curve.   |
|     |         | KNEE POINT                           | X( <input type="checkbox"/> )                                  | Adjusts the master knee point level during MANUAL knee adjustment.  |
|     |         | KNEE SLOPE                           | X( <input type="checkbox"/> )                                  | Adjusts the master knee slope level during MANUAL knee adjustment.  |
|     |         | KNEE SATURATION                      | X( <input type="checkbox"/> )                                  | Adjusts the knee saturation level.  |
|     |         | KNEE                                 | <input type="checkbox"/> ON/OFF                                | Turns ON/OFF the knee correction function.<br>(The DCC switch setting is ignored.)  |
|     |         | WHITE CLIP                           | <input type="checkbox"/> ON/OFF                                | Turns ON/OFF the white clip function.<br>(Used during video signal adjustment.)<br>Note : Video signal that exceeds the signal level of 109% or higher shall not be output even when this setting is set to OFF.  |
| 22  | LEVEL 5 | WHITE CLIP LEVEL                     | X( <input type="checkbox"/> )                                  | Sets the master white clip level.   |
|     |         | BURST LEVEL                          | X( <input type="checkbox"/> )                                  | Sets the burst level of encoder output.   |
|     |         | BURST PHASE                          | X( <input type="checkbox"/> )                                  | Sets the burst phase of encoder output. (PAL only)  |
|     |         | R-Y                                  | <input type="checkbox"/> ON/OFF                                | Turns ON/OFF the function of outputting the R-Y signal to encoder output.<br>(This function is set to ON automatically when CHROMA is set ON on 1/2 pages of FUNCTION.)   |
|     |         | B-Y                                  | <input type="checkbox"/> ON/OFF                                | Turns ON/OFF the function of outputting the B-Y signal to encoder output.<br>(This function is set to ON automatically when CHROMA is set ON on 1/2 pages of FUNCTION.)   |
|     |         | R-Y LEVEL                            | X( <input type="checkbox"/> )                                  | Sets the R-Y level of encoder output.   |
|     |         | B-Y LEVEL                            | X( <input type="checkbox"/> )                                  | Sets the B-Y level of encoder output.   |
|     |         | R-Y LEVEL (4:3)<br>B-Y LEVEL (4:3)   | X( <input type="checkbox"/> )<br>X( <input type="checkbox"/> ) | Note : The following items are displayed in DVW-790WS/790WSP/709WS/709WSP only. The following items are valid when the 16:9/4:3 MODE on the WIDE SCREEN page is set to 4:3.<br>Turns ON/OFF the function of outputting the R-Y signal to encoder output.<br>Turns ON/OFF the function of outputting the B-Y signal to encoder output. |
| 23  | LEVEL 6 | RGB LEVEL                            | X( <input type="checkbox"/> )                                  | Sets the video signal level of the RGB output.  |
|     |         | RGB SYNC LVL.                        | X( <input type="checkbox"/> )                                  | Sets the sync signal level of the RGB output.   |
|     |         | RGB SETUP LVL.                       | X( <input type="checkbox"/> )                                  | Sets the setup level of the RGB output.   |
|     |         | ENC Y LEVEL                          | X( <input type="checkbox"/> )                                  | Sets the Y signal level of the encoder output.  |
|     |         | ENC SYNC LVL.                        | X( <input type="checkbox"/> )                                  | Sets the sync signal level of the encoder output.   |
|     |         | ENC SETUP LVL.                       | X( <input type="checkbox"/> )                                  | Sets the setup level of the encoder output.   |
|     |         | RGB LEVEL (4:3)<br>ENC Y LEVEL (4:3) | X( <input type="checkbox"/> )<br>X( <input type="checkbox"/> ) | Note : The following items are displayed in DVW-790WS/790WSP/709WS/709WSP only. The following items are valid when the 16:9/4:3 MODE on the WIDE SCREEN page is set to 4:3.<br>Sets the video signal level of the RGB output.<br>Sets the setup level of the RGB output.  |



| No. | Page    | Item     | Setup       | Description   |
|-----|---------|----------|-------------|---|
| 24  | LEVEL 7 | R BLACK  | X ([0])     | Adjusts the black level of the R signal.  |
|     |         | G BLACK  | X ([0])     | Adjusts the black level of the G signal.  |
|     |         | B BLACK  | X ([0])     | Adjusts the black level of the B signal.  |
|     |         | R FLARE  | X ([0])     | Adjusts the flare correction of the R channel.  |
|     |         | G FLARE  | X ([0])     | Adjusts the flare correction of the G channel.  |
|     |         | B FLARE  | X ([0])     | Adjusts the flare correction of the B channel.  |
|     |         | FLARE    | [ON]/OFF    | Turns ON/OFF the flare correction circuit.  |
|     |         | TEST OUT | [ENC]/R/G/B | Sets the type of the video signal output from the TEST OUT connector. (Same as TEST OUT item of the "FUNCTION 1/2" page.) |

25 LEVEL 8 GAMMA TABLE [A]/B/C/D/F Selects the gamma table.



A : Gamma of  $x:y = 1:4$

B : Gamma of  $x:y = 1:5$

C : Gamma of  $x:y = 1:4.5$

D : Gamma of  $x:y = 1:0.7$

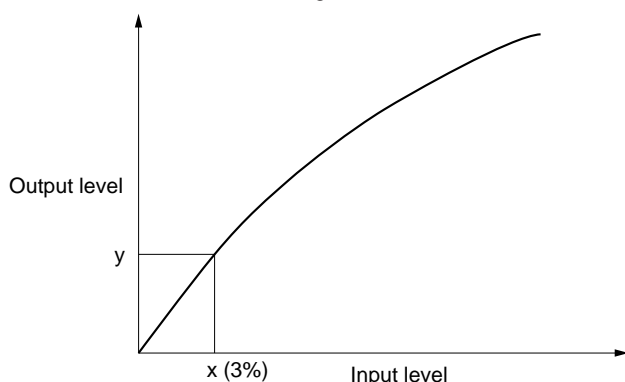
F : Gamma cine film

|                    |              |  |
|--------------------|--------------|--|
| MASTER GAMMA       | X ([0])      | Adjusts the master gamma correction curve.   |
| R GAMMA            | X ([0])      | Adjusts the gamma correction curve of the R channel.   |
| G GAMMA            | X ([0])      | Adjusts the gamma correction curve of the G channel.   |
| B GAMMA            | X ([0])      | Adjusts the gamma correction curve of the B channel.   |
| BLACK GAMMA RANGE  | LOW/MID/[HI] | Sets the range in which black gamma works<br>LOW : 0 to 7.2 %<br>MID : 0 to 14.4 %<br>HI : 0 to 28.8 % |
| MASTER BLACK GAMMA | X ([0])      | Adjusts the master black gamma correction.   |
| R BLACK GAMMA      | X ([0])      | Adjusts the black gamma correction of the R channel.   |
| G BLACK GAMMA      | X ([0])      | Adjusts the black gamma correction of the G channel.   |
| B BLACK GAMMA      | X ([0])      | Adjusts the black gamma correction of the B channel.   |

| No.   | Page                               | Item             | Setup  | Description  |
|---|------------------------------------|------------------|--|--|
| 26  | LEVEL 9                            | MATRIX           | ON/ <input type="checkbox"/> OFF   | Turns ON/OFF the matrix correction function.   |
|   |                                    | MATRIX TABLE     | <input type="checkbox"/> A/ <input type="checkbox"/> B   | Selects the matrix table. (Two status of A and B can be saved.)<br>(Same as the MATRIX TABLE on page 10 of LEVEL.)   |
|   |                                    | DETECT COLOR     | <input type="checkbox"/> OFF/ <input type="checkbox"/> EXEC  | Sets this item to the EXEC position to detect color of multi matrix.<br>(Align the VF gate marker to any of the color area that is divided into 16 divisions in the direction of hue, and press the rotary encoder.) |
|   |                                    | AXIS NUMBER      | <input type="checkbox"/> B/ <input type="checkbox"/> B+/MG-/ <input type="checkbox"/> MG/ <input type="checkbox"/> MG+/R/ <input type="checkbox"/> R+/YL-/ <input type="checkbox"/> YL/ <input type="checkbox"/> YL+/G-/ <input type="checkbox"/> G/ <input type="checkbox"/> G+/ <input type="checkbox"/> CY/ <input type="checkbox"/> CY+/B- | Select the desired hue to be corrected.  |
|   |                                    | SATURATION       | X ( <input type="checkbox"/> 0)  | Set the range in which multi matrix correction works.  |
|   |                                    | HUE              | X ( <input type="checkbox"/> 0)  | Set the hue in which multi matrix correction works.  |
|   |                                    | MATRIX AREA IND. | ON/ <input type="checkbox"/> OFF   | Turns ON/OFF the function of indicating zebra pattern on the VF screen indicating the multi matrix correction detect area.   |
|   |                                    | MATRIX (MULTI)   | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF  | Selects wheather the matrix correction values set on this page are valid or not.   |
| 27  | LEVEL 10                           | MATRIX           | ON/ <input type="checkbox"/> OFF   | Turns ON/OFF the linear matrix correction function.<br>(Same as MATRIX on the FUNCTION 1/2 pages.)   |
|   |                                    | MATRIX TABLE     | <input type="checkbox"/> A/ <input type="checkbox"/> B   | Selects the matrix table. (Two status of A and B can be saved.)  |
|   |                                    | R-G              | X ( <input type="checkbox"/> 0)  | Sets the matrix coefficient.   |
|   |                                    | R-B              | X ( <input type="checkbox"/> 0)  |  |
|   |                                    | G-R              | X ( <input type="checkbox"/> 0)  |  |
|   |                                    | G-B              | X ( <input type="checkbox"/> 0)  |  |
|   |                                    | B-R              | X ( <input type="checkbox"/> 0)  |  |
|   |                                    | B-G              | X ( <input type="checkbox"/> 0)  |  |
|   |                                    | MATRIX (MASTER)  | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF  | Selects wheather the matrix coefficient set on this page is valid or not.  |
| 28  | LEVEL 11                           | H PHASE          | X ( <input type="checkbox"/> 0)  | Adjust the camera H phase during external sync lock mode.  |
|   |                                    | SC PHASE         | X ( <input type="checkbox"/> 0)  | Adjust the camera subcarrier phase during external sync lock mode.   |
|   |                                    | SC 0/180 SEL.    | 0/180 ( <input type="checkbox"/> 0)  | Inverts the SC phase of the camera in the external genlock mode.   |
|   |                                    | SC-H             | X ( <input type="checkbox"/> 0)  | Set the SC-H phase.  |
|   |                                    | 29               | LEVEL 12   | IRIS SET   |
| IRIS MODE   | X ( <input type="checkbox"/> 0)    |                  |  | Sets sensitivity of AUTO iris. + (PEAK) ↔ - (AVERAGE)  |
| IRIS WEIGHT   | <input type="checkbox"/> 0/1/2/3/4 |                  |  | Sets the valid range of the auto iris.   |
| <div><div><div></div></div><div><div></div></div></div> <div>0 ←→ 4</div> <p>Note : The area shown by oblique lines are weighted during AUTO iris mode.</p> |                                    |                  |  |  |
|   |                                    | IRIS SPEED       | 0/1/ <input type="checkbox"/> 2/3/4/5  | Set the response speed of AUTO iris in the range of 0 (fast) ↔ 5 (slow).   |
|   |                                    | CLIP HIGH LIGHT  | ON/ <input type="checkbox"/> OFF   | Limits the auto iris detection to 100% for the subject of high brightness (video level: 100% or more)  |

| No. | Page           | Item         | Setup                           | Description   |
|-----|----------------|--------------|---------------------------------|---|
| 30  | W-SHADING G    |              |                                 | Used for the G channel white shading adjustment.  |
|     |                | H SAW        | X (0)                           | Adjusts amount of the H. SAW correction.  |
|     |                | H PARA       | X (0)                           | Adjusts amount of the H. PARA correction.   |
|     |                | V SAW        | X (0)                           | Adjusts amount of the V. SAW correction.  |
|     |                | V PARA       | X (0)                           | Adjusts amount of the V. PARA correction.   |
|     |                | H SAW (EXT)  | X (0)                           | Adjusts amount of the H. SAW correction when lens extender is in use.   |
|     |                | H PARA (EXT) | X (0)                           | Adjusts amount of the H. PARA correction when lens extender is in use.  |
|     |                | V SAW (EXT)  | X (0)                           | Adjusts amount of the V. SAW correction when lens extender is in use.   |
|     |                | V PARA (EXT) | X (0)                           | Adjusts amount of the V. PARA correction when lens extender is in use.  |
|     |                | SHAD COMP.   | ON/OFF                          | Turns ON/OFF the G channel white shading correction function.   |
|     |                | TEST OUT     | ENC/R/G/B                       | Sets the type of the video signal output from the TEST OUT connector. (Same as TEST OUT item of the "FUNCTION 1/2" page.) |
| 31  | W-SHADING R    |              |                                 | Used for the R channel white shading adjustment.  |
|     |                | H SAW        | X (0)                           | Adjusts amount of the H. SAW correction.  |
|     |                | H PARA       | X (0)                           | Adjusts amount of the H. PARA correction.   |
|     |                | V SAW        | X (0)                           | Adjusts amount of the V. SAW correction.  |
|     |                | V PARA       | X (0)                           | Adjusts amount of the V. PARA correction.   |
|     |                | H SAW (EXT)  | X (0)                           | Adjusts amount of the H. SAW correction when lens extender is in use.   |
|     |                | H PARA (EXT) | X (0)                           | Adjusts amount of the H. PARA correction when lens extender is in use.  |
|     |                | V SAW (EXT)  | X (0)                           | Adjusts amount of the V. SAW correction when lens extender is in use.   |
|     |                | V PARA (EXT) | X (0)                           | Adjusts amount of the V. PARA correction when lens extender is in use.  |
|     |                | SHAD COMP.   | ON/OFF                          | Turns ON/OFF the R channel white shading correction function.   |
|     |                | TEST OUT     | ENC/R/G/B                       | Sets the type of the video signal output from the TEST OUT connector. (Same as TEST OUT item of the "FUNCTION 1/2" page.) |
| 32  | W-SHADING B    |              |                                 | Used for the B channel white shading adjustment.  |
|     |                | H SAW        | X (0)                           | Adjusts amount of the H. SAW correction.  |
|     |                | H PARA       | X (0)                           | Adjusts amount of the H. PARA correction.   |
|     |                | V SAW        | X (0)                           | Adjusts amount of the V. SAW correction.  |
|     |                | V PARA       | X (0)                           | Adjusts amount of the V. PARA correction.   |
|     |                | H SAW(EXT)   | X (0)                           | Adjusts amount of the H. SAW correction when lens extender is in use.   |
|     |                | H PARA(EXT)  | X (0)                           | Adjusts amount of the H. PARA correction when lens extender is in use.  |
|     |                | V SAW(EXT)   | X (0)                           | Adjusts amount of the V. SAW correction when lens extender is in use.   |
|     |                | V PARA(EXT)  | X (0)                           | Adjusts amount of the V. PARA correction when lens extender is in use.  |
|     |                | SHAD COMP.   | ON/OFF                          | Turns ON/OFF the B channel white shading correction function.   |
|     |                | TEST OUT     | ENC/R/G/B                       | Sets the type of the video signal output from the TEST OUT connector. (Same as TEST OUT item of the "FUNCTION 1/2" page.) |
| 33  | DCC ADJUSTMENT | D RANGE      | 300/350/400/450/<br>500/550/600 | Sets the dynamic range when the DCC switch is set to ON.  |
|     |                | POINT        | X (0)                           | Setting the lowest knee point when the DCC switch is set to ON.   |
|     |                | GAIN         | X (0)                           | Setting the knee point when the DCC switch is set to ON.  |

| No. | Page       | Item            | Setup                                   | Description   |
|-----|------------|-----------------|---|---|
| 34  | OFFSET WHT |                 |   | This page is used to add offset to the AUTO white balance value at all times.<br>Data can be stored in the memory A-CH and the memory B-CH independently.<br>(Refer to the Operation Manual for more details.)    |
|     |            | OFFSET WHITE<A> | ON/ <input type="checkbox"/> OFF        | Turns ON/OFF the offset white balance function (A-CH)<br>Note : The following settings are not reflected unless the white balance automatic adjustment is performed.  |
|     |            | WARM-COOL<A>    | X ( <input type="checkbox"/> )          | Sets the offset value. (A-CH)   |
|     |            | FINE<A>         | X ( <input type="checkbox"/> )          | This item can be used for fine-adjustment of the above described WARM-COOL adjustment. (A-CH)   |
|     |            | OFFSET WHITE<B> | ON/ <input type="checkbox"/> OFF        | Turns ON/OFF the offset white balance function (B-CH)<br>Note : The following settings are not reflected unless the white balance automatic adjustment is performed.  |
|     |            | WARM-COOL<B>    | X ( <input type="checkbox"/> )          | Sets the offset value. (B-CH)   |
|     |            | FINE <B>        | X ( <input type="checkbox"/> )          | This item can be used for fine-adjustment of the above described WARM-COOL adjustment. (B-CH)   |
| 35  | PRESET WHT |                 |   | Use this page to set the color temperature by MANUAL adjustment when WHITE preset is selected.<br>(Refer to the Operation Manual for more details.)   |
|     |            | COLOR TEMP.<P>  | X ( <input type="text" value="3200"/> ) | Use this item to obtain the color temperature that is very close to the target color temperature. (The values shown on display are guide line.)<br>Note : The R. GAIN and B. GAIN values also change accordingly. |
|     |            | FINE<P>         | X ( <input type="checkbox"/> )          | Use this item for fine adjustment of color temperature when the desired color temperature cannot be obtained by the above described COLOR TEMP.   |
|     |            | R GAIN<P>       | X ( <input type="checkbox"/> )          | Use this item to obtain the desired color temperature during the WHITE preset mode, by changing R. GAIN.  |
|     |            | B GAIN<P>       | X ( <input type="checkbox"/> )          | Use this item to obtain the desired color temperature during the WHITE preset mode, by changing B. GAIN.  |

| No. | Page        | Item            | Setup                              | Description   |
|-----|-------------|-----------------|------------------------------------|---|
| 36  | OPERATION 1 | R-G/B-G SEL.    | ON/ <input type="checkbox"/> OFF   | Turns ON/OFF the function of adding the R-G and B-G signal to the video signal that is output from the TEST OUT connector.  |
|     |             | GAMMA TABLE     | <input type="checkbox"/> A/B/C/D/F | Selects the characteristics of the gamma correction. <div style="text-align: center;">  <p>Output level</p> <p>y</p> <p>x (3%)</p> <p>Input level</p> </div> <p>A : Gamma of x:y = 1:4<br/>           B : Gamma of x:y = 1:5<br/>           C : Gamma of x:y = 1:4.5<br/>           D : Gamma of x:y = 1:0.7<br/>           F : Gamma cine film</p> |
|     |             | LOW LIGHT       | ON/ <input type="checkbox"/> OFF   | Turns ON/OFF the LOW LIGHT indication function of VF.   |
|     |             | LOW LIGHT LEVEL | X( <input type="checkbox"/> 0)     | Sets the starting level of LOW LIGHT indication when the above described LOW LIGHT function is set to ON.<br>Note : When menu is being displayed, "L" is indicated instead of "LOW LIGHT" indication. (example) LOW LIGHT LEVEL : L 0   |
|     |             | SELECT BARS     | SMPTE/EBU/SNG<br>*Default value    | Sets the type of built-in color bars signal   |
|     |             |                 | SMPTE (NTSC)                       | EBU : EBU color bars (PAL)/Full color bars (NTSC)   |
|     |             |                 | EBU (PAL)                          | SNG : SNG color bars  |
|     |             | WHITE BCH       | ATW/ <input type="checkbox"/> AWB  | Sets the function of white balance (B-CH)<br>ATW : Auto tracing white balance<br>AWB : Auto white balance   |
|     |             | BATTERY WARNING | <input type="checkbox"/> 10%/20%   | Sets the blinking (alarm) starting level of the remaining amount of battery in ANTON BAUER Inc., battery.<br>10% : Starts blinking when the remaining amount of battery voltage reaches about 0.67 V.<br>20% : Starts showing the 20% display when the remaining amount of battery voltage reaches about 1.33 V, and starts blinking at about 1.0 V.  |
|     |             | WIDE AWB        | ON/ <input type="checkbox"/> OFF   | Turns ON/OFF the function of widening the adjustment range of auto white balance.   |
|     |             | ZEBRA           | ON/ <input type="checkbox"/> OFF   | Turns ON/OFF the zebra pattern indication when a VF that is not equipped with the ZEBRA switch.   |
|     |             | TURBO SW INDEP. | ON/ <input type="checkbox"/> OFF   | ON : Turns ON/OFF the TURBO GAIN function using the TURBO GAIN button, independent from the GAIN switch (L/M/H).<br>OFF : Set to OFF during normal operation.   |

| No. | Page        | Item             | Setup   | Description  |
|-----|-------------|------------------|---|--|
| 37  | OPERATION 2 | AWB LEVEL GATE   | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF                                     | Selects the desired detection mode for the white balance automatic adjustment.<br>ON : Detects the white level to adjust the white balance.<br>OFF : Detects the signal level around the center of the screen to adjust the white balance.   |
|     |             | COLOR VF         | <input type="checkbox"/> COMP/ <input type="checkbox"/> VBS                                   | Selects the output signal to VF when a color VF is used (component or VBS signal).<br>If noise when switching the RET video (VBS) is annoying, select the VBS position.  |
|     |             | REVERSE IMAGE    | ON/ <input type="checkbox"/> OFF  | Turns ON/OFF the image inversion function. (This item is displayed only when the image inverter board BKDW-704 is installed.)  |
|     |             | H DELAY          | X ( <input type="checkbox"/> 0)   | Adjust the H phase during image inversion mode. (This item is displayed only when the image inverter board BKDW-704 is installed.)   |
|     |             | REC TALLY        | <input type="checkbox"/> UPPER/ <input type="checkbox"/> BOTH                                 | Selection of LEDs inside VF to be turned on during REC.<br>UPPER : Only the LED in the top center of VF<br>BOTH : Only the LEDs in the top center and bottom center of VF  |
|     |             | TIME CODE DISP   | <input type="checkbox"/> OFF/ <input type="checkbox"/> VF/TEST/ <input type="checkbox"/> BOTH | Turns ON/OFF the function of outputting the time code to TEST OUT and on the VF screen.<br>OFF : Outputs no time code.<br>VF : Outputs the time code to the viewfinder only.<br>TEST : Outputs the time code to the TEST OUT connector only.<br>BOTH : Outputs the time code to the viewfinder and TEST OUT connector. |
|     |             | LOOP RECORDING   | <input type="checkbox"/> OFF/1/2/4/8 (sec)  | Turns ON/OFF the loop recording function and selects the loop recording time. (This item is displayed only when the picture cache board BKDW-703 is installed.)  |
| 38  | FRM SHUTTER |                  |   | (This page is displayed only when the frame shutter unit BKDW-705 is installed.)   |
|     |             | FRM SHUTTER UNIT | ON/ <input type="checkbox"/> OFF  | Turns ON/OFF the frame shutter function.   |
|     |             | TOTAL OP TIME    |   | Indicates the running hours of the frame shutter function.   |
| 39  | SG ADJ.     | H BLANKING WIDTH | X ( <input type="checkbox"/> 0)   | Sets the H blanking width.   |
|     |             | V BLANKING WIDTH | <input type="checkbox"/> 20H/ <input type="checkbox"/> 21H                                    | Set the V blanking width (20H/21H). (NTSC only)  |
| 40  | ENC ADJ.    | BURST START      | X ( <input type="checkbox"/> 0)   | Sets the starting position of the burst signal of the encoder output.  |
|     |             | BURST STOP       | X ( <input type="checkbox"/> 0)   | Sets the ending position of the burst signal of the encoder output.  |
|     |             | R-Y CAR. BAL.    | X ( <input type="checkbox"/> 0)   | Adjusts the R-Y carrier balance of the encoder output.   |
|     |             | B-Y CAR. BAL.    | X ( <input type="checkbox"/> 0)   | Adjusts the B-Y carrier balance of the encoder output.   |
|     |             | SYNC START       | X ( <input type="checkbox"/> 0)   | Sets the starting position of the sync signal of the encoder output.   |
|     |             | SYNC STOP        | X ( <input type="checkbox"/> 0)   | Sets the ending position of the sync signal of the encoder output.   |
|     |             | INT SC FREQ.     | X ( <input type="checkbox"/> 0)   | Adjusts the carrier frequency. (NTSC only)   |
| 41  | DATA RESET  |                  |   | Returns the setup values and adjustment values of the respective modes to the default setting when shipped from factory.   |
|     |             | USER             | To be executed by pressing the rotary encoder.  | Resets the data that has been set by the user mode.  |
|     |             | ENGINEER         | To be executed by pressing the rotary encoder.  | Resets the data that has been set by the engineer mode.  |
|     |             | SERVICE          | To be executed by pressing the rotary encoder.  | Resets the data that has been set by the service mode.   |

| No. | Page        | Item             | Setup   | Description   |
|-----|-------------|------------------|---|---|
| 42  | MENU SEL. 1 | MARKER 1/3       | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | Selects the pages to be displayed in the user mode.   |
|     |             | MARKER 2/3       | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | MARKER 3/3       | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | VF DISP 1/2      | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF |   |
|     |             | VF DISP 2/2      | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF |   |
|     |             | MASTER GAIN      | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF |   |
|     |             | SHOT ID          | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF |   |
|     |             | SHOT DATA        | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF |   |
|     |             | SHUTTER          | ON/ <input type="checkbox"/> OFF                          |   |
| 43  | MENU SEL. 2 | ! LED            | ON/ <input type="checkbox"/> OFF                          | Selects the pages to be displayed in the user mode.<br>(The WIDE SCREEN page appears when DVW-790WS/790WSP/<br>709WS/709WSP is used.) |
|     |             | SETUP CARD       | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF |   |
|     |             | FUNCTION 1/2     | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | FUNCTION 2/2     | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | WIDE SCREEN      | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | VF SETTING       | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | LEVEL 1<Detail>  | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | LEVEL 2<Detail>  | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | LEVEL 1<4:3DTL>  | ON/ <input type="checkbox"/> OFF                          |   |
| 44  | MENU SEL. 3 | LEVEL 2<4:3DTL>  | ON/ <input type="checkbox"/> OFF                          | Selects the pages to be displayed in the user mode.   |
|     |             | LEVEL 3<SKnDTL>  | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | LEVEL 4<Knee>    | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | LEVEL 5<AdjENC>  | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | LEVEL 6<AdjENC>  | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | LEVEL 7<BlkFlr>  | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | LEVEL 8<Gamma>   | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | LEVEL 9<Matrix>  | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | LEVEL 10<Matrix> | ON/ <input type="checkbox"/> OFF                          |   |
| 45  | MENU SEL. 4 | LEVEL 11<SC-H>   | ON/ <input type="checkbox"/> OFF                          | Selects the pages to be displayed in the user mode.   |
|     |             | LEVEL 12<A.Iris> | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | W-SHADING G      | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | W-SHADING R      | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | W-SHADING B      | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | DCC ADJ.         | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | OFFSET WHT       | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | PRESET WHT       | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | OPERATION 1      | ON/ <input type="checkbox"/> OFF                          |   |
| 46  | MENU SEL. 5 | OPERATION 2      | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF | Selects the pages to be displayed in the user mode.   |
|     |             | FRM SHUTTER      | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | SG ADJ.          | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | ENC ADJ.         | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | DATA RESET       | ON/ <input type="checkbox"/> OFF                          |   |
|     |             | CAMERAMAN 1-5    | <input type="checkbox"/> ON/ <input type="checkbox"/> OFF |   |

| No. | Page        | Item         | Setup                              | Description   |
|-----|-------------|--------------|------------------------------------|---|
| 47  | MEASUREMENT |              |                                    | Turns ON/OFF the functions that implement all the necessary settings to execute measurements of various characteristics. (Various settings are returned to the original values when this item is set to OFF.) |
|     |             | S/N          | ON/ <input type="checkbox"/> OFF   | Turns ON the necessary settings during S/N measurement. (DETAIL, APERTURE, CHROMA, GAMMA and MATRIX settings are set to OFF.)   |
|     |             | MODULATION   | ON/ <input type="checkbox"/> OFF   | Turns ON the necessary settings during modulation measurement. (DETAIL, APERTURE, GAMMA and MATRIX settings are set to OFF.)  |
|     |             | RESOLUTION   | ON/ <input type="checkbox"/> OFF   | Turns ON the necessary settings during resolution measurement. (MATRIX setting is set to OFF.)  |
|     |             | SENSITIVITY  | ON/ <input type="checkbox"/> OFF   | Turns ON the necessary settings during sensitivity measurement. (WHITE CLIP and KNEE settings are set to OFF.)  |
|     |             | REGISTRATION | ON/ <input type="checkbox"/> OFF   | Turns ON the necessary settings during registration measurement. (DETAIL and APERTURE settings are set to OFF.)   |
|     |             | MASTER BLACK | X ( <input type="checkbox"/> 0)    | Adjusts the master black  |
|     |             | TEST OUT     | <input type="checkbox"/> ENC/R/G/B | Selects the type of video signal to be output from the TEST OUT connector. (Same as TEST OUT item of the "FUNCTION 1/2" page)   |
| 48  | B-SHADING G |              |                                    | Used for adjusting the G channel black shading.   |
|     |             | H SAW        | X ( <input type="checkbox"/> 0)    | Adjusts the amount of H. SAW correction.  |
|     |             | H PARA       | X ( <input type="checkbox"/> 0)    | Adjusts the amount of H. PARA correction.   |
|     |             | V SAW        | X ( <input type="checkbox"/> 0)    | Adjusts the amount of V. SAW correction.  |
|     |             | V PARA       | X ( <input type="checkbox"/> 0)    | Adjusts the amount of V. PARA correction.   |
|     |             | SHAD COMP.   | <input type="checkbox"/> ON/OFF    | Turns ON/OFF the G channel black shading correction function.   |
|     |             | TEST OUT     | <input type="checkbox"/> ENC/R/G/B | Selects the type of video signal to be output from the TEST OUT connector. (Same as TEST OUT item of the "FUNCTION 1/2" page).  |
| 49  | B-SHADING R |              |                                    | Used for adjusting the R channel black shading.   |
|     |             | H SAW        | X ( <input type="checkbox"/> 0)    | Adjusts the amount of H. SAW correction.  |
|     |             | H PARA       | X ( <input type="checkbox"/> 0)    | Adjusts the amount of H. PARA correction.   |
|     |             | V SAW        | X ( <input type="checkbox"/> 0)    | Adjusts the amount of V. SAW correction.  |
|     |             | V PARA       | X ( <input type="checkbox"/> 0)    | Adjusts the amount of V. PARA correction.   |
|     |             | SHAD COMP.   | <input type="checkbox"/> ON/OFF    | Turns ON/OFF the R channel black shading correction function.   |
|     |             | TEST OUT     | <input type="checkbox"/> ENC/R/G/B | Selects the type of video signal to be output from the TEST OUT connector. (Same as TEST OUT item of the "FUNCTION 1/2" page).  |
| 50  | B-SHADING B |              |                                    | Used for adjusting the B channel black shading.   |
|     |             | H SAW        | X ( <input type="checkbox"/> 0)    | Adjusts the amount of H. SAW correction.  |
|     |             | H PARA       | X ( <input type="checkbox"/> 0)    | Adjusts the amount of H. PARA correction.   |
|     |             | V SAW        | X ( <input type="checkbox"/> 0)    | Adjusts the amount of V. SAW correction.  |
|     |             | V PARA       | X ( <input type="checkbox"/> 0)    | Adjusts the amount of V. PARA correction.   |
|     |             | SHAD COMP.   | <input type="checkbox"/> ON/OFF    | Turns ON/OFF the B channel black shading correction function.   |
|     |             | TEST OUT     | <input type="checkbox"/> ENC/R/G/B | Selects the type of video signal to be output from the TEST OUT connector. (Same as TEST OUT item of the "FUNCTION 1/2" page).  |



| No. | Page       | Item   | Setup  | Description   |
|-----|------------|--|--|---|
| 51  | TG Adj.    | BC COMP.ADJ.   | X ( <input type="text" value="0"/> )         | This item is strictly for adjustment in the factory.<br>(Never change the setting.)   |
|     |            | BC   | <input type="text" value="ON"/> /OFF         | This item is strictly for adjustment in the factory.<br>(Never change the setting.)   |
|     |            | FIELD/FRAME  | <input type="text" value="FIELD"/> /FRAME    | Selects the CCD read-out system (Same as FIELD/FRAME item of the "FUNCTION 2/2" page).<br>FIELD : Reading in units of field (normal setting).<br>FRAME : Reading in units of frame (select for improved vertical resolution).<br>Note : The FRAME reading has a more residual image than the FIELD reading. |
|     |            | TEST OUT   | <input type="text" value="ENC"/> /R/G/B      | Selects the type of video signal to be output from the TEST OUT connector.<br>(Same as TEST OUT item of the "FUNCTION 1/2" page)  |
|     |            | R VSUB   | X ( <input type="text" value="0"/> )         | Sets the V substrate voltage value of the R signal.   |
|     |            | G VSUB   | X ( <input type="text" value="0"/> )         | Sets the V substrate voltage value of the G signal.   |
|     |            | B VSUB   | X ( <input type="text" value="0"/> )         | Sets the V substrate voltage value of the B signal.   |
| 52  | VA ADJ.1/2 | R GAIN (TMP)<br>G GAIN (TMP)<br>B GAIN (TMP)             |  | Displays the gain value of the R/G/B white balance amplifier.   |
|     |            | R MOD.BAL. (TMP)<br>G MOD.BAL. (TMP)<br>B MOD.BAL. (TMP) |  | Displays the modulation correction values to the R/G/B video amplifier circuits.  |
|     |            | SAW/REC  | <input type="text" value="SAW"/> /REC        | Selects the TEST signal to be output when the TEST SAW item is turned on.<br>SAW : SAWTOOTH<br>REC : RECTANGULAR  |
|     |            | TEST LEVEL   | X ( <input type="text" value="0"/> )         | Adjusts the gain of the TEST signal. (The amplitude of SAWTOOTH and RECTANGULAR is automatically set for unity peak level.)   |
|     |            | TEST SAW   | ON/ <input type="text" value="OFF"/>         | Turns ON/OFF the function to forcibly select the TEST signal for the video signal system (used for video signal adjustment).  |
| 53  | VA ADJ.2/2 | R PREKNEE (KS ON)  | X ( <input type="text" value="0"/> )         | Adjusts the pre-knee level when KNEE SATURATION of the R/G/B signal is turned on.   |
|     |            | G PREKNEE (KS ON)  | X ( <input type="text" value="0"/> )         |   |
|     |            | B PREKNEE (KS ON)  | X ( <input type="text" value="0"/> )         |   |
|     |            | R PREKNEE  | X ( <input type="text" value="0"/> )         | Adjusts the pre-knee level when DCC of the R/G/B signal is turned on.   |
|     |            | G PREKNEE  | X ( <input type="text" value="0"/> )         |   |
|     |            | B PREKNEE  | X ( <input type="text" value="0"/> )         |   |
|     |            | TEST OUT   | <input type="text" value="ENC"/> /R/G/B      | Selects the type of video signal to be output from the TEST OUT connector.<br>(Same as TEST OUT item of the "FUNCTION 1/2" page).   |
|     |            | TEST SAW   | ON/ <input type="text" value="OFF"/>         | Turns ON/OFF the function to forcibly select the TEST signal for the video signal system (used for video signal adjustment).  |
| 54  | AD ADJ.    | G AD GAIN  | X ( <input type="text" value="0"/> )         | Adjusts the gain of the R/G/B video signal respectively that is input to the A/D converter.   |
|     |            | R AD GAIN  | X ( <input type="text" value="0"/> )         |   |
|     |            | B AD GAIN  | X ( <input type="text" value="0"/> )         | Note : Never change GAIN of the G channel AD converter.   |
|     |            | AD CLOCK PHASE   | 0 to 7                                       | Adjusts the clock phase of the G signal of the A/D converter.   |
|     |            | R/B CLOCK PHASE  | 0 to 7                                       | Adjusts the clock phase of the R/B signals of the A/D converter.  |
| 55  | ND COMP.   | ND DETECTION   | <input type="text" value="OFF"/> /EXEC/RESET | EXEC : Used for color-correcting the ND filters.<br>RESET : The correction values for the ND filters of ND1 to ND4 are reset.<br>OFF : When adjustment is completed, this item returns to the OFF position automatically.   |
|     |            | ND1 DET. =   | <input type="text" value="YET"/> /OK!        |   |
|     |            | ND2 DET. =   | <input type="text" value="YET"/> /OK!        |   |
|     |            | ND3 DET. =   | <input type="text" value="YET"/> /OK!        |   |
|     |            | ND4 DET. =   | <input type="text" value="YET"/> /OK!        |   |
| 56  | VTR ADJ.   | EQ ADJUSTMENT  | <input type="text" value="OFF"/> /EXEC       | Used for playback equalizer automatic adjustment.   |
|     |            | REC CURRENT ADJ.   | <input type="text" value="OFF"/> /EXEC       | Used for record current automatic adjustment.   |
|     |            | CHECK ERROR RATE   | ON/ <input type="text" value="OFF"/>         | Used for playback equalizer adjustment and recording current adjustment.  |

| No. | Page          | Item     | Display                            | Description  |
|-----|---------------|----------|------------------------------------|--|
| 57  | DEVICE STATUS |          |                                    | Checks the communication function of each device.  |
|     |               | <IO>     |                                    | Checks the I/O.  |
|     |               | DR1      | <input type="checkbox"/> OK/NG     | IC20/DR-387 board : Reads the CHB information, and others.   |
|     |               | DR2      | <input type="checkbox"/> OK/NG     | IC1/DR-387 board : Controls the filter servo/rotary shutter, and others.   |
|     |               | DR3      | OK/NG/ <input type="checkbox"/> -- | I/O IC/BKDW-705 : Controls the rotary shutter.<br>(This item is displayed only when the frame shutter unit BKDW-705 is installed.) |
|     |               | VA       | <input type="checkbox"/> OK/NG     | IC11/VA-167 board : Changes the gain.  |
|     |               | MB1      | <input type="checkbox"/> OK/NG     | IC101/MB-811 board : Sets the VF tally, and others.  |
|     |               | MB2      | <input type="checkbox"/> OK/NG     | IC102/MB-811 board : Sets the VF tally, controls the fan, and others.  |
|     |               | MB3      | <input type="checkbox"/> OK/NG     | IC103/MB-811 board : Sets the back tally, and others.  |
|     |               | IF       | <input type="checkbox"/> OK/NG     | IC101/IF-716 board : Reads the AWB/ABB switch and others.  |
|     |               | TC1      | <input type="checkbox"/> OK/NG     | IC101/CP-329 board : Reads the VTR SAVE switch and others.   |
|     |               | TC2      | <input type="checkbox"/> OK/NG     | IC102/CP-329 board : Reads the BARS switch and others.   |
|     |               | <EEPROM> |                                    | Checks the EEPROM.   |
|     |               | DR1      | <input type="checkbox"/> OK/NG     | IC15/DR-387 board : CHB factory adjustment value   |
|     |               | DR2      | <input type="checkbox"/> OK/NG     | IC16/DR-387 board : CHB factory adjustment value   |
|     |               | DCP      | <input type="checkbox"/> OK/NG     | IC140/DCP-17 board : AD factory adjustment value, and others   |
|     |               | ES       | <input type="checkbox"/> OK/NG     | IC18/ES-23 board : Encoder factory adjustment value, and others  |
|     |               | IF       | <input type="checkbox"/> OK/NG     | IC102/IF-716 board : Model information (serial number, model name) and others  |
|     |               | <DP>     |                                    | Checks the serial access status of the DSP LSI.  |
|     |               | SH       | <input type="checkbox"/> OK/NG     | IC185/DCP-17 board   |
|     |               | IE       | <input type="checkbox"/> OK/NG     | IC205/DCP-17 board   |
|     |               | PR       | <input type="checkbox"/> OK/NG     | IC606/DCP-17 board   |
|     |               | RC       | <input type="checkbox"/> OK/NG     | IC71/DCP-17 board  |

| No. | Page           | Item      | Display  | Description   |
|-----|----------------|-----------|--|---|
| 58  | DP DIAG.STATUS | <Pulse>   |  | Checks if the fundamental pulses such as HD, VD, and others are input to the DSP LSI. |
|     |                | SH        | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | IC185/DCP-17 board  |
|     |                | IE        | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | IC205/DCP-17 board  |
|     |                | PR        | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | IC606/DCP-17 board  |
|     |                | RC        | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | IC71/DCP-17 board   |
|     |                | <SH → IE> |  | Checks connection of SH (IC185/DCP-17 board) and IE (IC205/DCP-17).                   |
|     |                | R         | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | R ch main line signal   |
|     |                | G         | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | G ch main line signal   |
|     |                | B         | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | B ch main line signal   |
|     |                | <IE → PR> |  | Checks connection of IE (IC205/DCP-17 board) and PR (IC606/DCP-17).                   |
|     |                | R         | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | R ch main line signal   |
|     |                | G         | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | G ch main line signal   |
|     |                | B         | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | B ch main line signal   |
|     |                | MPX       | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | Multiplex signal (for detection)  |
|     |                | DTL       | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | Detail signal   |
|     |                | <ROM>     |  | Displays the ROM version.   |
|     |                | AT        |  | IC10, 11/DCP-17 board : ROM for camera control microprocessor                         |
|     |                | SY        |  | IC25, 28/DCP-17 board : ROM for VTR control microprocessor                            |
|     |                | SV1       |  | IC1/SV-210 board : ROM 1 for servo control microprocessor                             |
|     |                | SV2       |  | IC2/SV-210 board : ROM 2 for servo control microprocessor                             |
|     |                | TC        |  | IC801/TC-101 board : ROM for time code control microprocessor                         |
|     |                | <DATA>    |  | Checks the data.  |
|     |                | WSH       | <input type="checkbox"/> OK/ <input type="checkbox"/> NG | IC152/DCP-17 board : White shading data   |

### 2-1-3. Setup Menu List

The setup menu items can be written into the setup card. At the same time, turning ON/OFF and adjustment of functions can be implemented using the remote control unit RM-P9/B150.

The menu items that can be saved in the setup card and those that can be controlled from the remote control unit RM-P9/B150 among all menu items, are shown as follows when the service mode is selected.

|         |  |
|---------|--|
| SETUP C | Yes or No is displayed to indicate whether data can be written in the setup card.  |
| RM-P9   | M, P, or No is displayed to indicate whether this item can be operated when remote control unit RM-P9 is connected.<br>M (MENU) : Can be operated at the bottom of the RM-P9.<br>P (PANEL) : Can be operated in the front of the RM-P9.<br>No : Cannot be operated by the RM-P9.         |
| RM-B150 | M, P, or No is displayed to indicate whether this item can be operated when remote control unit RM-B150 is connected.<br>M (MENU) : Can be operated at the bottom of the RM-B150.<br>P (PANEL) : Can be operated in the front of the RM-B150.<br>No : Cannot be operated by the RM-B150. |
| F-SET   | Sets the factory default value.  |
| C-SET   | Write the setting state of the customer.   |

| No. | Page        | Item             | Setup C | RM-P9 | RM-B150 | F-SET | C-SET | Remark |
|-----|-------------|------------------|---------|-------|---------|-------|-------|--------|
| 1   | MARKER 1/3  | SAFETY ZONE      | YES     | M     | M       | ON    |       |        |
|     |             | SAFETY AREA      | YES     | M     | M       | 90    |       |        |
|     |             | CENTER           | YES     | M     | M       | OFF   |       |        |
|     |             | CENTER H         | YES     | M     | M       | 0     |       |        |
|     |             | CENTER V         | YES     | M     | M       | 0     |       |        |
| 2   | MARKER 2/3  | BOX CURSOR       | YES     | M     | M       | OFF   |       |        |
|     |             | BOX WIDTH        | YES     | M     | M       | 0     |       |        |
|     |             | BOX HEIGHT       | YES     | M     | M       | 0     |       |        |
|     |             | BOX H            | YES     | M     | M       | 0     |       |        |
|     |             | BOX V            | YES     | M     | M       | 0     |       |        |
| 3   | MARKER 3/3  | TEST OUT MIX     | YES     | M     | M       | OFF   |       |        |
|     |             | RET MIX          | YES     | M     | M       | OFF   |       |        |
|     |             | TEST OUT VF DISP | YES     | M     | M       | OFF   |       |        |
|     |             | TEST OUT MENU    | YES     | M     | M       | OFF   |       |        |
|     |             | RM VF MENU INH.  | YES     | M     | M       | ON    |       |        |
| 4   | VF DISP 1/2 | DISP MODE        | YES     | M     | M       | 3     |       |        |
|     |             | EXTENDER         | YES     | M     | M       | ON    |       |        |
|     |             | ZOOM             | YES     | M     | M       | ON    |       |        |
| 5   | VF DISP 2/2 | FILTER           | YES     | M     | M       | ON    |       |        |
|     |             | WHITE            | YES     | M     | M       | ON    |       |        |
|     |             | GAIN             | YES     | M     | M       | ON    |       |        |
|     |             | SHUTTER          | YES     | M     | M       | ON    |       |        |
|     |             | TAPE             | YES     | M     | M       | ON    |       |        |
|     |             | AUDIO            | YES     | M     | M       | ON    |       |        |
|     |             | IRIS             | YES     | M     | M       | ON    |       |        |
| 6   | MASTER GAIN | LOW              | YES     | M     | M/P(*1) | 0 dB  |       |        |
|     |             | MID              | YES     | M     | M/P(*1) | 9 dB  |       |        |
|     |             | HIGH             | YES     | M     | M/P(*1) | 18 dB |       |        |
|     |             | TURBO            | YES     | M     | M       | 42 dB |       |        |
| 7   | SHOT ID     | ID-1             | YES     | M     | M       |       |       |        |
|     |             | ID-2             | NO      | M     | M       |       |       |        |
|     |             | ID-3             | NO      | M     | M       |       |       |        |
|     |             | ID-4             | NO      | M     | M       |       |       |        |
| 8   | SHOT DISP   | DATE             | YES     | M     | M       | OFF   |       |        |
|     |             | TIME             | YES     | M     | M       | OFF   |       |        |
|     |             | MODEL NAME       | YES     | M     | M       | OFF   |       |        |
|     |             | SERIAL NO.       | YES     | M     | M       | OFF   |       |        |
|     |             | CASSTTE NO.      | YES     | M     | M       | OFF   |       |        |
|     |             | SHOT NO.         | YES     | M     | M       | OFF   |       |        |
|     |             | ID SELECT        | YES     | M     | M       | OFF   |       |        |

\*1 : The RM configuration menu of RM-B150 is used.

| No. | Page         | Item                     | Setup C | RM-P9             | RM-B150             | F-SET                    | C-SET | Remark                                |
|-----|--------------|--------------------------|---------|-------------------|---------------------|--------------------------|-------|---------------------------------------|
| 9   | SHUTTER      | EVS                      | YES     | P                 | P                   | ON                       |       |                                       |
|     |              | CLS                      | YES     | P                 | P                   | ON                       |       |                                       |
|     |              | 1/100(NTSC)<br>1/60(PAL) | YES     | P                 | P                   | ON                       |       |                                       |
|     |              | 1/125                    | YES     | P                 | P                   | ON                       |       |                                       |
|     |              | 1/250                    | YES     | P                 | P                   | ON                       |       |                                       |
|     |              | 1/500                    | YES     | P                 | P                   | ON                       |       |                                       |
|     |              | 1/1000                   | YES     | P                 | P                   | ON                       |       |                                       |
|     |              | 1/2000                   | YES     | P                 | P                   | ON                       |       |                                       |
| 10  | ! LED        | MASTER GAIN              | YES     | M                 | M                   | ON                       |       |                                       |
|     |              | SHUTTER ON               | YES     | M                 | M                   | ON                       |       |                                       |
|     |              | WHITE PRESET             | YES     | M                 | M                   | OFF                      |       |                                       |
|     |              | ATW RUN                  | YES     | M                 | M                   | OFF                      |       |                                       |
|     |              | EXTENDER ON              | YES     | M                 | M                   | ON                       |       |                                       |
|     |              | FILTER 2,3,4             | YES     | M                 | M                   | OFF                      |       |                                       |
|     |              | FILTER A,C,D             | YES     | M                 | M                   | OFF                      |       | DVW-790WS/790WSP/<br>709W/709WSP only |
|     |              | A.IRIS OVERRIDE          | YES     | M                 | M                   | OFF                      |       |                                       |
| 11  | SETUP CARD   | READ (→ CAM)             |         | M                 | M                   |                          |       |                                       |
|     |              | WRITE (→ CARD)           |         | M                 | M                   |                          |       |                                       |
|     |              | ID EDIT                  |         | M                 | M                   |                          |       |                                       |
|     |              | WRITE PROTECT            |         | M                 | M                   | OFF                      |       |                                       |
|     |              | WHITE DATA               |         | M                 | M                   | OFF                      |       |                                       |
| 12  | FUNCTION 1/2 | TEST OUT                 | NO      | M                 | M                   | ENC                      |       |                                       |
|     |              | DETAIL                   | YES     | M                 | M                   | ON                       |       |                                       |
|     |              | APERTURE                 | YES     | M                 | M                   | ON                       |       |                                       |
|     |              | SKIN TONE DTL            | YES     | M                 | M                   | OFF                      |       |                                       |
|     |              | MATRIX                   | YES     | M                 | M                   | OFF (J)<br>ON (except J) |       |                                       |
|     |              | GAMMA                    | YES     | M                 | M                   | ON                       |       |                                       |
|     |              | BLACK GAMMA              | YES     | M                 | M                   | OFF                      |       |                                       |
|     |              | CHROMA                   | YES     | M                 | M                   | ON                       |       |                                       |
|     |              | TEST SAW                 | YES     | P <sup>(※2)</sup> | P/M <sup>(※3)</sup> | OFF                      |       |                                       |
|     |              | CROSS COLOR FLT          | YES     | M                 | M                   | OFF                      |       |                                       |
|     |              |                          |         |                   |                     |                          |       |                                       |
| 13  | FUNCTION 2/2 | GENLOCK                  | YES     | M                 | M                   | ON                       |       |                                       |
|     |              | CAM RET.                 | YES     | M                 | M                   | OFF                      |       |                                       |
|     |              | FILTER INH.              | YES     | M                 | M                   | OFF                      |       |                                       |
|     |              | FIELD/FRAME              | YES     | M                 | M                   | FIELD                    |       |                                       |
|     |              | A.IRIS OVERRIDE          | YES     | P                 | P                   | OFF                      |       |                                       |
|     |              | DCC FUNCTION SEL         | YES     | M                 | M                   | DCC                      |       |                                       |
|     |              | REAR BNC OUT             | YES     | M                 | M                   | VBS                      |       | When BKDW-702 is installed.           |
|     |              | VTR MODE                 | YES     | M                 | M                   | OFF                      |       |                                       |
|     |              | REC INHIBIT (CCU)        | YES     | M                 | M                   | ON                       |       |                                       |
|     |              | ASSIGNABLE SW            | YES     | M                 | M                   | OFF                      |       |                                       |

※2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

※3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF, cannot be changed from the setup menu if RM-B150 is set to the panel-active.

| No. | Page        | Item                   | Setup C | RM-P9             | RM-B150             | F-SET | C-SET | Remark                                 |
|-----|-------------|------------------------|---------|-------------------|---------------------|-------|-------|--|
| 14  | WIDE SCREEN | 16:9/4:3 MODE          | YES     | M                 | M                   | 16:9  |       | DVW-790WS/790WSP/<br>709WS/709WSP only |
|     |             | VF ASPECT              | YES     | M                 | M                   | AUTO  |       |  |
|     |             | BOX/4:3/14:9<br>LIMITS | YES     | M                 | M                   | BOX   |       |  |
|     |             | 16:9 BARS ID           | YES     | M                 | M                   | OFF   |       |  |
|     |             | 16:9 VF ID             | YES     | M                 | M                   | OFF   |       |  |
| 15  | VF SETTING  | ZEBRA 1 DETECT         | YES     | M                 | M                   | 70    |       |  |
|     |             | ZEBRA 1 APERTURE       | YES     | M                 | M                   | 10    |       |  |
|     |             | ZEBRA 2 DETECT         | YES     | M                 | M                   | 100   |       |  |
|     |             | ZEBRA SELECT           | YES     | M                 | M                   | 1     |       |  |
|     |             | TEST OUT ZEBRA         | YES     | M                 | M                   | OFF   |       |  |
|     |             | VF DTL LEVEL           | YES     | M                 | M                   | 0     |       |  |
| 16  | LEVEL 1     | DETAIL LVL             | YES     | P <sup>(※2)</sup> | P/M <sup>(※3)</sup> | 0     |       |  |
|     |             | H/V RATIO              | YES     | M                 | M                   | 0     |       |  |
|     |             | DTL FREQ               | YES     | M                 | M                   | 0     |       |  |
|     |             | CRISPENING             | YES     | M                 | M                   | 0     |       |  |
|     |             | APT. LEVEL             | YES     | M                 | M                   | 0     |       |  |
|     |             | DTL W.CL P             | YES     | M                 | M                   | 0     |       |  |
|     |             | DTL V B.CL P           | YES     | M                 | M                   | 0     |       |  |
|     |             | DTL H B.CL P           | YES     | M                 | M                   | 0     |       |  |
|     |             | LVL DEPEND             | YES     | M                 | M                   | ON    |       |  |
|     |             | L.DEP.LVL              | YES     | M                 | M                   | 0     |       |  |
| 17  | LEVEL 2     | KNEE APT               | YES     | M                 | M                   | OFF   |       |  |
|     |             | K.APT.LVL              | YES     | M                 | M                   | 0     |       |  |
|     |             | DTL COMB               | YES     | M                 | M                   | 0     |       |  |
|     |             | C.C.S.LVL              | YES     | M                 | M                   | 0     |       | NTSC only                              |
| 18  | LEVEL 1#4:3 | DETAIL LVL             | YES     | P <sup>(※2)</sup> | P/M <sup>(※3)</sup> | 0     |       | DVW-790WS/790WSP/<br>709WS/709WSP only |
|     |             | H/V RATIO              | YES     | M                 | M                   | 0     |       |  |
|     |             | DTL FREQ               | YES     | M                 | M                   | 0     |       |  |
|     |             | CRISPENING             | YES     | M                 | M                   | 0     |       |  |
|     |             | APT. LEVEL             | YES     | M                 | M                   | 0     |       |  |
|     |             | DTL W.CL P             | YES     | M                 | M                   | 0     |       |  |
|     |             | DTL V B.CL P           | YES     | M                 | M                   | 0     |       |  |
|     |             | DTL H B.CL P           | YES     | M                 | M                   | 0     |       |  |
|     |             | LVL DEPEND             | YES     | M                 | M                   | ON    |       |  |
|     |             | L.DEP.LVL              | YES     | M                 | M                   | 0     |       |  |
| 19  | LEVEL 2#4:3 | KNEE APT               | YES     | M                 | M                   | OFF   |       | DVW-790WS/790WSP/<br>709WS/709WSP only |
|     |             | K.APT.LVL              | YES     | M                 | M                   | 0     |       |  |
|     |             | DTL COMB               | YES     | M                 | M                   | 0     |       |  |
|     |             | C.C.S.LVL              | YES     | M                 | M                   | 0     |       | DVW-790WS/709WS only<br>NTSC only      |

※2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

※3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF, cannot be changed from the setup menu if RM-B150 is set to the panel-active.

| No. | Page    | Item              | Setup C | RM-P9 | RM-B150 | F-SET | C-SET | Remark                             |
|-----|---------|-------------------|---------|-------|---------|-------|-------|------------------------------------|
| 20  | LEVEL 3 | SKIN TONE DTL     | YES     | M     | P/M(*4) | OFF   |       |                                    |
|     |         | SKIN TONE DET     | YES     | M     | M       | OFF   |       |                                    |
|     |         | SUPPRESS LEVEL    | YES     | M     | M       | 0     |       |                                    |
|     |         | SATURATION        | YES     | M     | M       | 0     |       |                                    |
|     |         | HUE               | YES     | M     | M       | 0     |       |                                    |
|     |         | WIDTH             | YES     | M     | M       | 0     |       |                                    |
|     |         | SKIN AREA IND.    | NO      | M     | M       | OFF   |       |                                    |
| 21  | LEVEL 4 | MASTER BLACK      | YES     | P(*2) | P/M(*3) | 0     |       |                                    |
|     |         | MASTER GAMMA      | YES     | P(*2) | P/M(*3) | 0     |       |                                    |
|     |         | MASTER BLK GAMMA  | YES     | M     | P/M(*4) | 0     |       |                                    |
|     |         | KNEE POINT        | YES     | P(*2) | P/M(*3) | 0     |       |                                    |
|     |         | KNEE SLOPE        | YES     | M     | M       | 0     |       |                                    |
|     |         | KNEE SATURATION   | YES     | M     | M       | 0     |       |                                    |
|     |         | KNEE              | YES     | M     | M       | ON    |       |                                    |
|     |         | WHITE CLIP        | YES     | M     | M       | ON    |       |                                    |
|     |         | WHITE CLIP LEVEL  | YES     | M     | M       | 0     |       |                                    |
| 22  | LEVEL 5 | BURST LEVEL       | YES     | M     | M       | 0     |       |                                    |
|     |         | BURST PHASE       | YES     | M     | M       | 0     |       | PAL only                           |
|     |         | R-Y               | YES     | M     | M       | ON    |       |                                    |
|     |         | B-Y               | YES     | M     | M       | ON    |       |                                    |
|     |         | R-Y LEVEL         | YES     | M     | M       | 0     |       |                                    |
|     |         | B-Y LEVEL         | YES     | M     | M       | 0     |       |                                    |
|     |         | R-Y LEVEL (4:3)   | YES     | M     | M       | 0     |       | DVW-790WS/790WSP/709WS/709WSP only |
|     |         | B-Y LEVEL (4:3)   | YES     | M     | M       | 0     |       |                                    |
| 23  | LEVEL 6 | RGB LEVEL         | YES     | M     | M       | 0     |       |                                    |
|     |         | RGB SYNC LVL.     | YES     | M     | M       | 0     |       |                                    |
|     |         | RGB SETUP LVL.    | YES     | M     | M       | 0     |       |                                    |
|     |         | ENC Y LEVEL       | YES     | M     | M       | 0     |       |                                    |
|     |         | ENC SYNC LVL.     | YES     | M     | M       | 0     |       |                                    |
|     |         | ENC SETUP LVL.    | YES     | M     | M       | 0     |       |                                    |
|     |         | RGB LEVEL (4:3)   | YES     | M     | M       | 0     |       | DVW-790WS/790WSP/709WS/709WSP only |
|     |         | ENC Y LEVEL (4:3) | YES     | M     | M       | 0     |       |                                    |
| 24  | LEVEL 7 | R BLACK           | YES     | P(*2) | P/M(*3) | 0     |       |                                    |
|     |         | G BLACK           | YES     | M     | M       | 0     |       |                                    |
|     |         | B BLACK           | YES     | P(*2) | P/M(*3) | 0     |       |                                    |
|     |         | R FLARE           | YES     | M     | P/M(*4) | 0     |       |                                    |
|     |         | G FLARE           | YES     | M     | M       | 0     |       |                                    |
|     |         | B FLARE           | YES     | M     | P/M(*4) | 0     |       |                                    |
|     |         | FLARE             | YES     | M     | M       | ON    |       |                                    |
|     |         | TEST OUT          | NO      | M     | M       | ENC   |       |                                    |

\*2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

\*3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF , cannot be changed from the setup menu if RM-B150 is set to the panel-active.

\*4 : It can be allocated to the respective adjustment controls on the RM-B150 using the RM configuration menu.

However, if some items are set to the absolute value mode by the RM configuration menu, the corresponding adjustment items cannot be changed from the setup menu if RM-B150 is set to panel-active.



| No. | Page     | Item               | Setup C | RM-P9 | RM-B150 | F-SET | C-SET | Remark |
|-----|----------|--------------------|---------|-------|---------|-------|-------|--------|
| 25  | LEVEL 8  | GAMMA TABLE        | YES     | M     | M       | A     |       |        |
|     |          | MASTER GAMMA       | YES     | P(*2) | P/M(*3) | 0     |       |        |
|     |          | R GAMMA            | YES     | M     | M       | 0     |       |        |
|     |          | G GAMMA            | YES     | M     | M       | 0     |       |        |
|     |          | B GAMMA            | YES     | M     | M       | 0     |       |        |
|     |          | BLACK GAMMA RANGE  | YES     | M     | M       | HI    |       |        |
|     |          | MASTER BLACK GAMMA | YES     | M     | P/M(*4) | 0     |       |        |
|     |          | R BLACK GAMMA      | YES     | M     | M       | 0     |       |        |
|     |          | G BLACK GAMMA      | YES     | M     | M       | 0     |       |        |
|     |          | B BLACK GAMMA      | YES     | M     | M       | 0     |       |        |
| 26  | LEVEL 9  | MATRIX             | YES     | M     | M       | OFF   |       |        |
|     |          | MATRIX TABLE       | YES     | M     | M       | A     |       |        |
|     |          | DETECT COLOR       | NO      | M     | M       | OFF   |       |        |
|     |          | AXIS NUMBER        | YES     | M     | M       | B     |       |        |
|     |          | SATURATION         | YES     | M     | M       | 0     |       |        |
|     |          | HUE                | YES     | M     | M       | 0     |       |        |
|     |          | MATRIX AREA IND.   | NO      | M     | M       | OFF   |       |        |
|     |          | MATRIX (MULTI)     | NO      | M     | M       | ON    |       |        |
| 27  | LEVEL 10 | MATRIX             | YES     | M     | M       | OFF   |       |        |
|     |          | MATRIX TABLE       | YES     | M     | M       | A     |       |        |
|     |          | R-G                | YES     | M     | M       | 0     |       |        |
|     |          | R-B                | YES     | M     | M       | 0     |       |        |
|     |          | G-R                | YES     | M     | M       | 0     |       |        |
|     |          | G-B                | YES     | M     | M       | 0     |       |        |
|     |          | B-R                | YES     | M     | M       | 0     |       |        |
|     |          | B-G                | YES     | M     | M       | 0     |       |        |
| 28  | LEVEL 11 | MATRIX (MASTER)    | NO      | M     | M       | ON    |       |        |
|     |          | H PHASE            | YES     | M     | M       | 0     |       |        |
|     |          | SC PHASE           | YES     | M     | M       | 0     |       |        |
|     |          | SC 0/180 SEL.      | YES     | M     | M       | 0     |       |        |
| 29  | LEVEL 12 | SC-H               | YES     | M     | M       | 0     |       |        |
|     |          | IRIS SET           | YES     | M     | M       | 0     |       |        |
|     |          | IRIS MODE          | YES     | M     | M       | 0     |       |        |
|     |          | IRIS WEIGHT        | YES     | M     | M       | 0     |       |        |
|     |          | IRIS SPEED         | YES     | M     | M       | 2     |       |        |
|     |          | CLIP HIGH LIGHT    | YES     | M     | M       | OFF   |       |        |

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\*3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF, cannot be changed from the setup menu if RM-B150 is set to the panel-active.

| No. | Page              | Item             | Setup C | RM-P9 | RM-B150 | F-SET | C-SET | Remark |
|-----|-------------------|------------------|---------|-------|---------|-------|-------|--------|
| 30  | W-SHADING G       | H SAW            | YES     | M     | M       | 0     |       |        |
|     |                   | H PARA           | YES     | M     | M       | 0     |       |        |
|     |                   | V SAW            | YES     | M     | M       | 0     |       |        |
|     |                   | V PARA           | YES     | M     | M       | 0     |       |        |
|     |                   | H SAW (EXT)      | YES     | M     | M       | 0     |       |        |
|     |                   | H PARA (EXT)     | YES     | M     | M       | 0     |       |        |
|     |                   | V SAW (EXT)      | YES     | M     | M       | 0     |       |        |
|     |                   | V PARA (EXT)     | YES     | M     | M       | 0     |       |        |
|     |                   | SHAD COMP.       | YES     | M     | M       | ON    |       |        |
|     |                   | TEST OUT         | YES     | M     | M       | ENC   |       |        |
| 31  | W-SHADING R       | H SAW            | YES     | M     | M       | 0     |       |        |
|     |                   | H PARA           | YES     | M     | M       | 0     |       |        |
|     |                   | V SAW            | YES     | M     | M       | 0     |       |        |
|     |                   | V PARA           | YES     | M     | M       | 0     |       |        |
|     |                   | H SAW (EXT)      | YES     | M     | M       | 0     |       |        |
|     |                   | H PARA (EXT)     | YES     | M     | M       | 0     |       |        |
|     |                   | V SAW (EXT)      | YES     | M     | M       | 0     |       |        |
|     |                   | V PARA (EXT)     | YES     | M     | M       | 0     |       |        |
|     |                   | SHAD COMP.       | YES     | M     | M       | ON    |       |        |
|     |                   | TEST OUT         | YES     | M     | M       | ENC   |       |        |
| 32  | W-SHADING B       | H SAW            | YES     | M     | M       | 0     |       |        |
|     |                   | H PARA           | YES     | M     | M       | 0     |       |        |
|     |                   | V SAW            | YES     | M     | M       | 0     |       |        |
|     |                   | V PARA           | YES     | M     | M       | 0     |       |        |
|     |                   | H SAW (EXT)      | YES     | M     | M       | 0     |       |        |
|     |                   | H PARA (EXT)     | YES     | M     | M       | 0     |       |        |
|     |                   | V SAW (EXT)      | YES     | M     | M       | 0     |       |        |
|     |                   | V PARA (EXT)     | YES     | M     | M       | 0     |       |        |
|     |                   | SHAD COMP.       | YES     | M     | M       | ON    |       |        |
|     |                   | TEST OUT         | YES     | M     | M       | ENC   |       |        |
| 33  | DCC<br>ADJUSTMENT | D RANGE          | YES     | M     | M       | 500   |       |        |
|     |                   | POINT            | YES     | M     | M       | 0     |       |        |
|     |                   | GAIN             | YES     | P(*2) | P/M(*3) | 0     |       |        |
| 34  | OFFSET WHT        | OFFSET WHITE (A) | YES     | M     | M       | OFF   |       |        |
|     |                   | WARM-COOL (A)    | YES     | M     | M       | 0     |       |        |
|     |                   | FINE (A)         | YES     | M     | M       | 0     |       |        |
|     |                   | OFFSET WHITE (B) | YES     | M     | M       | OFF   |       |        |
|     |                   | WARM-COOL (B)    | YES     | M     | M       | 0     |       |        |
|     |                   | FINE (B)         | YES     | M     | M       | 0     |       |        |

\*2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

\*3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF , cannot be changed from the setup menu if RM-B150 is set to the panel-active.

| No. | Page        | Item             | Setup C | RM-P9 | RM-B150 | F-SET                     | C-SET | Remark                      |
|-----|-------------|------------------|---------|-------|---------|---------------------------|-------|-----------------------------|
| 35  | PRESET WHT  | COLOR TEMP (P)   | YES     | M     | M       | 3200                      |       |                             |
|     |             | FINE (P)         | YES     | M     | M       | 0                         |       |                             |
|     |             | R GAIN (P)       | YES     | M     | M       | 0                         |       |                             |
|     |             | B GAIN (P)       | YES     | M     | M       | 0                         |       |                             |
| 36  | OPERATION 1 | R-G/B-G SEL.     | YES     | M     | M       | OFF                       |       |                             |
|     |             | GAMMA TABLE      | YES     | M     | M       | A                         |       |                             |
|     |             | LOW LIGHT        | YES     | M     | M       | OFF                       |       |                             |
|     |             | LOW LIGHT LEVEL  | YES     | M     | M       | 0                         |       |                             |
|     |             | SELECT BARS      | YES     | M     | M       | SMPTE (NTSC)<br>EBU (PAL) |       |                             |
|     |             | WHITE BCH        | YES     | NO    | NO      | AWB                       |       |                             |
|     |             | BATTERY WARNING  | YES     | M     | M       | 10%                       |       |                             |
|     |             | WIDE AWB         | YES     | M     | M       | OFF                       |       |                             |
|     |             | ZEBRA            | YES     | M     | M       | OFF                       |       |                             |
|     |             | TURBO SW INDEP.  | YES     | M     | M       | OFF                       |       |                             |
| 37  | OPERATION 2 | AWB LEVEL GATE   | YES     | M     | M       | ON                        |       |                             |
|     |             | COLOR VF         | NO      | M     | M       | COMP                      |       |                             |
|     |             | REVERSE IMAGE    | YES     | M     | M       | OFF                       |       | When BKDW-704 is installed. |
|     |             | H DELAY          | YES     | M     | M       | 0                         |       | When BKDW-704 is installed. |
|     |             | REC TALLY        | YES     | M     | M       | UPPER                     |       |                             |
|     |             | TIME CODE DISP   | YES     | M     | M       | OFF                       |       |                             |
|     |             | LOOP RECORDING   | YES     | M     | M       | OFF                       |       | When BKDW-703 is installed. |
| 38  | FRM SHUTTER | FRM SHUTTER UNIT | YES     | M     | M       | OFF                       |       | When BKDW-705 is installed. |
|     |             | TOTAL OP TIME    |         |       |         | 0H                        |       | When BKDW-705 is installed. |
| 39  | SG ADJ.     | H BLANKING WIDTH | YES     | M     | M       | 0                         |       |                             |
|     |             | V BLANKING WIDTH | YES     | M     | M       | 20H                       |       | NTSC only                   |
| 40  | ENC ADJ.    | BURST START      | YES     | M     | M       | 0                         |       |                             |
|     |             | BURST STOP       | YES     | M     | M       | 0                         |       |                             |
|     |             | R-Y CAR. BAL.    | YES     | M     | M       | 0                         |       |                             |
|     |             | B-Y CAR. BAL.    | YES     | M     | M       | 0                         |       |                             |
|     |             | SYNC START       | YES     | M     | M       | 0                         |       |                             |
|     |             | SYNC STOP        | YES     | M     | M       | 0                         |       |                             |
|     |             | INT SC FREQ.     | YES     | M     | M       | 0                         |       | NTSC only                   |
| 41  | DATA RESET  | USER             |         | M     | M       |                           |       |                             |
|     |             | ENGINEER         |         | M     | M       |                           |       |                             |
|     |             | SERVICE          |         | M     | M       |                           |       |                             |
| 42  | MENU SEL. 1 | MARKER 1/3       | YES     | M     | M       | ON                        |       |                             |
|     |             | MARKER 2/3       | YES     | M     | M       | OFF                       |       |                             |
|     |             | MARKER 3/3       | YES     | M     | M       | OFF                       |       |                             |
|     |             | VF DISP 1/2      | YES     | M     | M       | ON                        |       |                             |
|     |             | VF DISP 2/2      | YES     | M     | M       | ON                        |       |                             |
|     |             | MASTER GAIN      | YES     | M     | M       | ON                        |       |                             |
|     |             | SHOT ID          | YES     | M     | M       | ON                        |       |                             |
|     |             | SHOT DATA        | YES     | M     | M       | ON                        |       |                             |
|     |             | SHUTTER          | YES     | M     | M       | OFF                       |       |                             |
|     |             | ! LED            | YES     | M     | M       | OFF                       |       |                             |

| No. | Page        | Item             | Setup C | RM-P9             | RM-B150             | F-SET | C-SET | Remark                                 |
|-----|-------------|------------------|---------|-------------------|---------------------|-------|-------|--|
| 43  | MENU SEL. 2 | Setup CARD       | YES     | M                 | M                   | ON    |       |  |
|     |             | FUNCTION 1/2     | YES     | M                 | M                   | OFF   |       |  |
|     |             | FUNCTION 2/2     | YES     | M                 | M                   | OFF   |       |  |
|     |             | VF SETTING       | YES     | M                 | M                   | OFF   |       |  |
|     |             | WIDE SCREEN      | YES     | M                 | M                   | OFF   |       | DVW-790WS/790WSP/<br>709WS/709WSP only |
|     |             | LEVEL 1<Detail>  | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 2<Detail>  | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 1<4:3DTL>  | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 2<4:3DTL>  | YES     | M                 | M                   | OFF   |       |  |
| 44  | MENU SEL. 3 | LEVEL 3<SKnDTL>  | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 4<Knee>    | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 5<AdjENC>  | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 6<AdjENC>  | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 7<BlkFlr>  | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 8<Gamma>   | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 9<Matrix>  | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 10<Matrix> | YES     | M                 | M                   | OFF   |       |  |
|     |             | LEVEL 11<SC-H>   | YES     | M                 | M                   | OFF   |       |  |
| 45  | MENU SEL. 4 | LEVEL 12<A.Iris> | YES     | M                 | M                   | OFF   |       |  |
|     |             | W-SHADING G      | YES     | M                 | M                   | OFF   |       |  |
|     |             | W-SHADING R      | YES     | M                 | M                   | OFF   |       |  |
|     |             | W-SHADING B      | YES     | M                 | M                   | OFF   |       |  |
|     |             | DCC ADJ.         | YES     | M                 | M                   | OFF   |       |  |
|     |             | OFFSET WHT       | YES     | M                 | M                   | OFF   |       |  |
|     |             | PRESET WHT       | YES     | M                 | M                   | OFF   |       |  |
|     |             | OPERATION 1      | YES     | M                 | M                   | OFF   |       |  |
|     |             | OPERATION 2      | YES     | M                 | M                   | ON    |       |  |
| 46  | MENU SEL. 5 | FRM SHUTTER      | YES     | M                 | M                   | OFF   |       |  |
|     |             | SG ADJ.          | YES     | M                 | M                   | OFF   |       |  |
|     |             | ENC ADJ.         | YES     | M                 | M                   | OFF   |       |  |
|     |             | DATA RESET       | YES     | M                 | M                   | OFF   |       |  |
| 47  | MEASUREMENT | CAMERAMAN 1-5    | YES     | M                 | M                   | ON    |       |  |
|     |             | S/N              |         | M                 | M                   | OFF   |       |  |
|     |             | MODULATION       |         | M                 | M                   | OFF   |       |  |
|     |             | RESOLUTION       |         | M                 | M                   | OFF   |       |  |
|     |             | SENSITIVITY      |         | M                 | M                   | OFF   |       |  |
|     |             | REGISTRATION     |         | M                 | M                   | OFF   |       |  |
|     |             | MASTER BLACK     | YES     | P <sup>(※2)</sup> | P/M <sup>(※3)</sup> | 0     |       |  |
|     |             | TEST OUT         |         | M                 | M                   | ENC   |       |  |

※2 : It can be set from the setup menu. However, if the setup menu and the adjustment control of the RM-P9 are used at the same time, the setup value may not be reflected correctly.

※3 : However, the adjustment items that are set to the absolute mode by the RM configuration menu and the TEST signal output ON/OFF, cannot be changed from the setup menu if RM-B150 is set to the panel-active.

| No. | Page        | Item              | Setup C | RM-P9 | RM-B150 | F-SET | C-SET | Remark |
|-----|-------------|-------------------|---------|-------|---------|-------|-------|--------|
| 48  | B-SHADING G | H SAW             | NO      | M     | M       | 0     |       |        |
|     |             | H PARA            | NO      | M     | M       | 0     |       |        |
|     |             | V SAW             | NO      | M     | M       | 0     |       |        |
|     |             | V PARA            | NO      | M     | M       | 0     |       |        |
|     |             | SHAD COMP.        | NO      | M     | M       | ON    |       |        |
|     |             | TEST OUT          | NO      | M     | M       | ENC   |       |        |
| 49  | B-SHADING R | H SAW             | NO      | M     | M       | 0     |       |        |
|     |             | H PARA            | NO      | M     | M       | 0     |       |        |
|     |             | V SAW             | NO      | M     | M       | 0     |       |        |
|     |             | V PARA            | NO      | M     | M       | 0     |       |        |
|     |             | SHAD COMP.        | NO      | M     | M       | ON    |       |        |
|     |             | TEST OUT          | NO      | M     | M       | ENC   |       |        |
| 50  | B-SHADING B | H SAW             | NO      | M     | M       | 0     |       |        |
|     |             | H PARA            | NO      | M     | M       | 0     |       |        |
|     |             | V SAW             | NO      | M     | M       | 0     |       |        |
|     |             | V PARA            | NO      | M     | M       | 0     |       |        |
|     |             | SHAD COMP.        | NO      | M     | M       | ON    |       |        |
|     |             | TEST OUT          | NO      | M     | M       | ENC   |       |        |
| 51  | TG Adj.     | BC COMP.ADJ.      | NO      | M     | M       | 0     |       |        |
|     |             | BC                | NO      | M     | M       | ON    |       |        |
|     |             | FIELD/FRAME       | YES     | M     | M       | FIELD |       |        |
|     |             | TEST OUT          | NO      | M     | M       | ENC   |       |        |
|     |             | R VSUB            | NO      | M     | M       | 0     |       |        |
|     |             | G VSUB            | NO      | M     | M       | 0     |       |        |
|     |             | B VSUB            | NO      | M     | M       | 0     |       |        |
| 52  | VA ADJ.1/2  | R GAIN (TMP)      |         |       |         |       |       |        |
|     |             | G GAIN (TMP)      |         |       |         |       |       |        |
|     |             | B GAIN (TMP)      |         |       |         |       |       |        |
|     |             | R MOD.BAL. (TMP)  |         |       |         |       |       |        |
|     |             | G MOD.BAL. (TMP)  |         |       |         |       |       |        |
|     |             | B MOD.BAL. (TMP)  |         |       |         |       |       |        |
|     |             | SAW/REC           | NO      | M     | M       | SAW   |       |        |
|     |             | TEST LEVEL        | NO      | M     | M       | 0     |       |        |
|     |             | TEST SAW          | NO      | M     | M       | OFF   |       |        |
| 53  | VA ADJ.2/2  | R PREKNEE (KS ON) | NO      | M     | M       | 0     |       |        |
|     |             | G PREKNEE (KS ON) | NO      | M     | M       | 0     |       |        |
|     |             | B PREKNEE (KS ON) | NO      | M     | M       | 0     |       |        |
|     |             | R PREKNEE         | NO      | M     | M       | 0     |       |        |
|     |             | G PREKNEE         | NO      | M     | M       | 0     |       |        |
|     |             | B PREKNEE         | NO      | M     | M       | 0     |       |        |
|     |             | TEST OUT          | NO      | M     | M       | ENC   |       |        |
|     |             | TEST SAW          | NO      | M     | M       | OFF   |       |        |

| No. | Page          | Item             | Setup C | RM-P9 | RM-B150 | F-SET | C-SET | Remark |
|-----|---------------|------------------|---------|-------|---------|-------|-------|--------|
| 54  | AD ADJ.       | G AD GAIN        | NO      | M     | M       | 0     |       |        |
|     |               | R AD GAIN        | NO      | M     | M       | 0     |       |        |
|     |               | B AD GAIN        | NO      | M     | M       | 0     |       |        |
|     |               | AD CLOCK PHASE   | NO      | M     | M       |       |       |        |
|     |               | R/B CLOCK PHASE  | NO      | M     | M       |       |       |        |
| 55  | ND COMP.      | ND DETECTION     |         |       |         | OFF   |       |        |
|     |               | ND1 DET. =       |         |       |         | YET   |       |        |
|     |               | ND2 DET. =       |         |       |         | YET   |       |        |
|     |               | ND3 DET. =       |         |       |         | YET   |       |        |
|     |               | ND4 DET. =       |         |       |         | YET   |       |        |
| 56  | VTR ADJ.      | EQ ADJUSTMENT    |         | M     | M       | OFF   |       |        |
|     |               | REC CURRENT ADJ. |         | M     | M       | OFF   |       |        |
|     |               | CHECK ERROR RATE |         | M     | M       | OFF   |       |        |
| 57  | DEVICE STATUS | <IO>             |         |       |         |       |       |        |
|     |               | DR1              |         |       |         | OK    |       |        |
|     |               | DR2              |         |       |         | OK    |       |        |
|     |               | DR3              |         |       |         | OK    |       |        |
|     |               | VA               |         |       |         | OK    |       |        |
|     |               | MB1              |         |       |         | OK    |       |        |
|     |               | MB2              |         |       |         | OK    |       |        |
|     |               | MB3              |         |       |         | OK    |       |        |
|     |               | IF               |         |       |         | OK    |       |        |
|     |               | TC1              |         |       |         | OK    |       |        |
|     |               | TC2              |         |       |         | OK    |       |        |
|     |               | <EEPROM>         |         |       |         |       |       |        |
|     |               | DR1              |         |       |         | OK    |       |        |
|     |               | DR2              |         |       |         | OK    |       |        |
|     |               | DCP              |         |       |         | OK    |       |        |
|     |               | ES               |         |       |         | OK    |       |        |
|     |               | IF               |         |       |         | OK    |       |        |
|     |               | <DP>             |         |       |         |       |       |        |
|     |               | SH               |         |       |         | OK    |       |        |
|     |               | IE               |         |       |         | OK    |       |        |
|     |               | PR               |         |       |         | OK    |       |        |
|     |               | RC               |         |       |         | OK    |       |        |

| No. | Page           | Item      | Setup C | RM-P9 | RM-B150 | F-SET | C-SET | Remark |
|-----|----------------|-----------|---------|-------|---------|-------|-------|--------|
| 58  | DP DIAG.STATUS | <Pulse>   |         |       |         |       |       |        |
|     |                | SH        |         |       |         | OK    |       |        |
|     |                | IE        |         |       |         | OK    |       |        |
|     |                | PR        |         |       |         | OK    |       |        |
|     |                | RC        |         |       |         | OK    |       |        |
|     |                | <SH → IE> |         |       |         |       |       |        |
|     |                | R         |         |       |         | OK    |       |        |
|     |                | G         |         |       |         | OK    |       |        |
|     |                | B         |         |       |         | OK    |       |        |
|     |                | <IE → PR> |         |       |         |       |       |        |
|     |                | R         |         |       |         | OK    |       |        |
|     |                | G         |         |       |         | OK    |       |        |
|     |                | B         |         |       |         | OK    |       |        |
|     |                | MPX       |         |       |         | OK    |       |        |
|     |                | DTL       |         |       |         | OK    |       |        |
|     |                | <ROM>     |         |       |         |       |       |        |
|     |                | AT        |         |       |         | OK    |       |        |
|     |                | SY        |         |       |         | OK    |       |        |
|     |                | SV1       |         |       |         | OK    |       |        |
|     |                | SV2       |         |       |         | OK    |       |        |
|     |                | TC        |         |       |         | OK    |       |        |
|     |                | <ROM>     |         |       |         |       |       |        |
|     |                | WSH       |         |       |         | OK    |       |        |





## **Section 3**

### **Parts Replacement**

#### **3-1. Replacing Boards**

##### **3-1-1. Notes on Board Replacement**

This section describes how to replace the following boards:

- 3-1-2. Replacing the MB-810 and MB-811 Boards
- 3-1-3. Replacing the HN-260 Board
- 3-1-4. Replacing the CI-20 and CI-21 Boards
- 3-2-3. Replacing the Boards Inside the CCD Unit

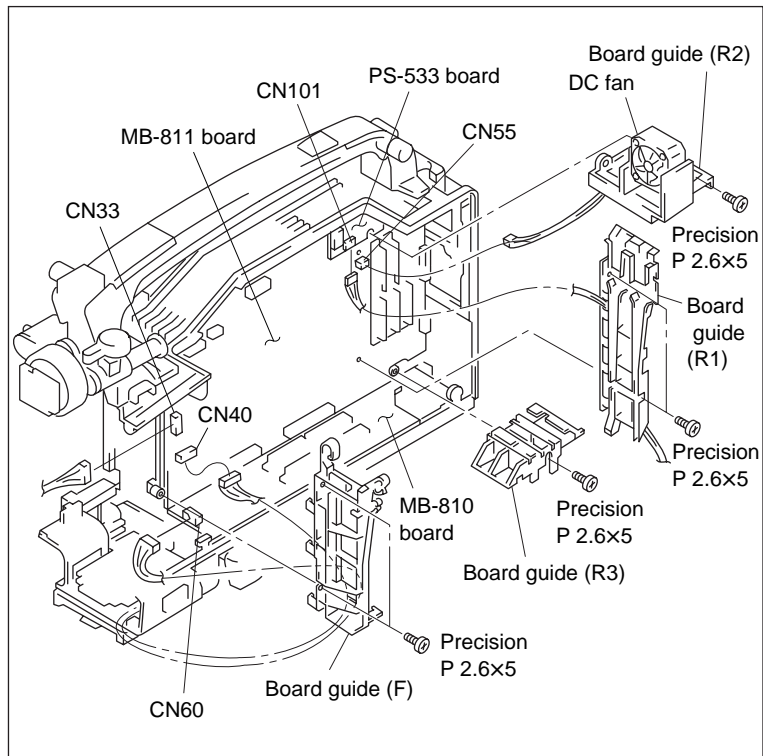
For precautions during the replacement of parts and boards, refer to the following sections:

- 1-4. IC Link
- 1-5. Notes on CCD Unit
- 1-6. Description on EEPROM/NV-RAM Data
- 1-7. Note on the DCP-17 Board Replacement
- 1-8. EEPROM on the ES-23 Board
- 1-9. Note on the IF-716 Board Replacement
- 1-10. Note on the RE-160 and RE-161 Boards
- 1-11. DC Fans Precaution
- 1-12. Setting/Adjusting After Board Replacement

### 3-1-2. Replacing the MB-810 and MB-811 Boards

#### MB-810 Board

1. Open the inside panel.
2. Disconnect the three flexible card wires from the connectors (CN121, CN122, and CN123) on the TC-101 board.
3. Pull the plug-in boards (DCP board assembly and DVP board assembly) out.  
(Refer to the Maintenance Manual Part 1, Section 1-9.)
4. Remove the outside panel.
5. Remove the CCD unit. (Refer to Section “3-2-1. Replacing the CCD unit”.)
6. Pull the SV-210 board out.
7. Disconnect the harness from the connector (CN55) on the MB-811 board.
8. Remove the precision screw, and then remove the board guide (R2) and the DC fan.
9. Disconnect the harnesses from the connector (CN60) on the MB-810 board and from the connector (CN33 and CN40) on the MB-811 board.
10. Untie the harnesses from the clamp of the board guide (F), and then remove the two precision screws to remove the board guide (F).
11. Disconnect the harness from the connector (CN101) on the PS-533 board.
12. Remove the two precision screws to remove the board guide (R1).
13. Remove the precision screw to remove the board guide (R3).



14. Disconnect the harnesses from the two connectors (CN10 and CN50) on the MB-810 board.
15. Remove the connector box assembly. (Refer to step 1 of Section 3-3-1.)
16. Remove the six screws. And then loosen the connector connected to the MB-811 board to remove the MB-810 board.

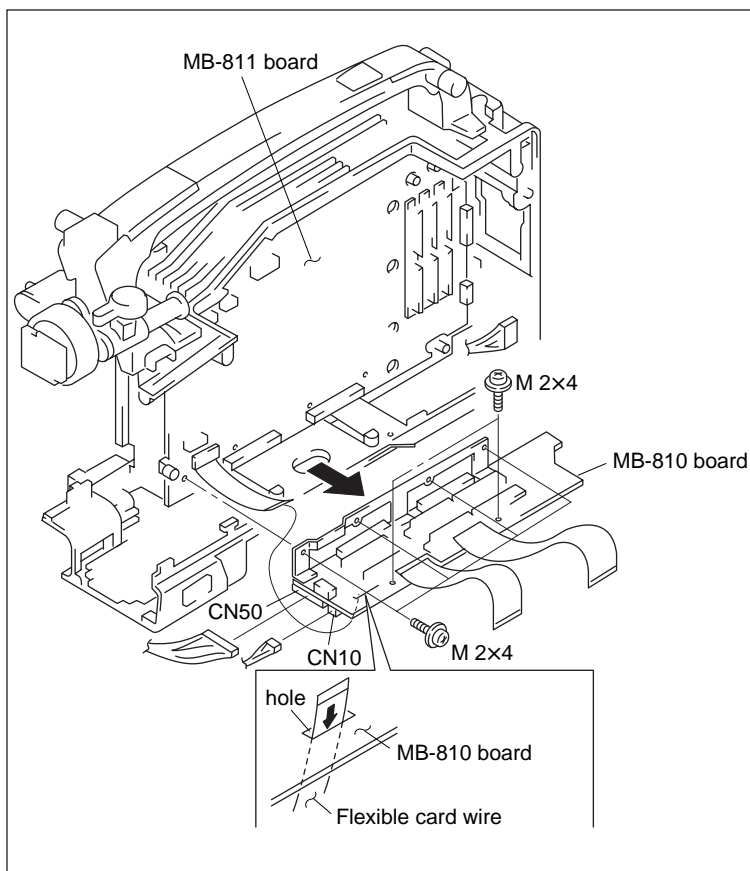
**Note**

Being careful not to fold the flexible card wire, remove the card wire from the hole of the MB-810 board.

17. Reinstall the MB-810 board by reversing the removing steps.

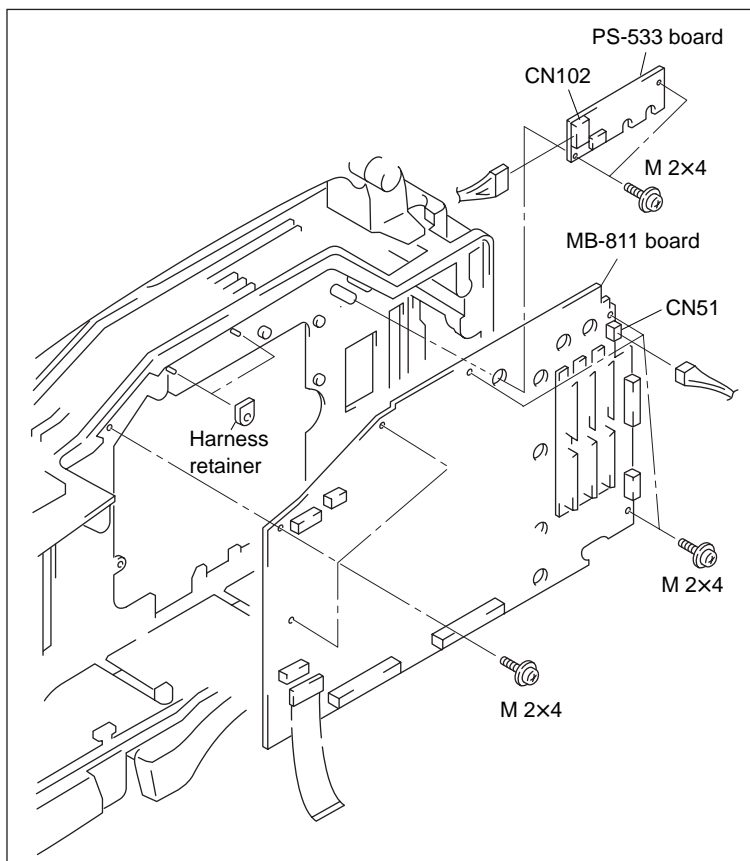
**Note**

When reinstalling the DC fan, see Section “3-5-1. Upper DC Fan.”



## MB-811 Board

1. Remove the MB-810 board. (Refer to Section 3-1-2.)
2. Disconnect the harness from the connector (CN51) on the MB-811 board.
3. Remove the two harness retainers.
4. Disconnect the harness from the connector (CN102) on the PS-533 board.
5. Remove the two screws to remove the PS-533 board.
6. Remove the 40-pin fitting assembly. (Refer to Section “3-1-4. Replacing the CI-20 and CI-21 Boards”.)
7. Remove the lower DC fan. (Refer to Section “3-5-2. Lower DC Fan”.)
8. Remove the six screws to remove the MB-811 board.
9. Reinstall the MB-811 board by reversing the removing steps.



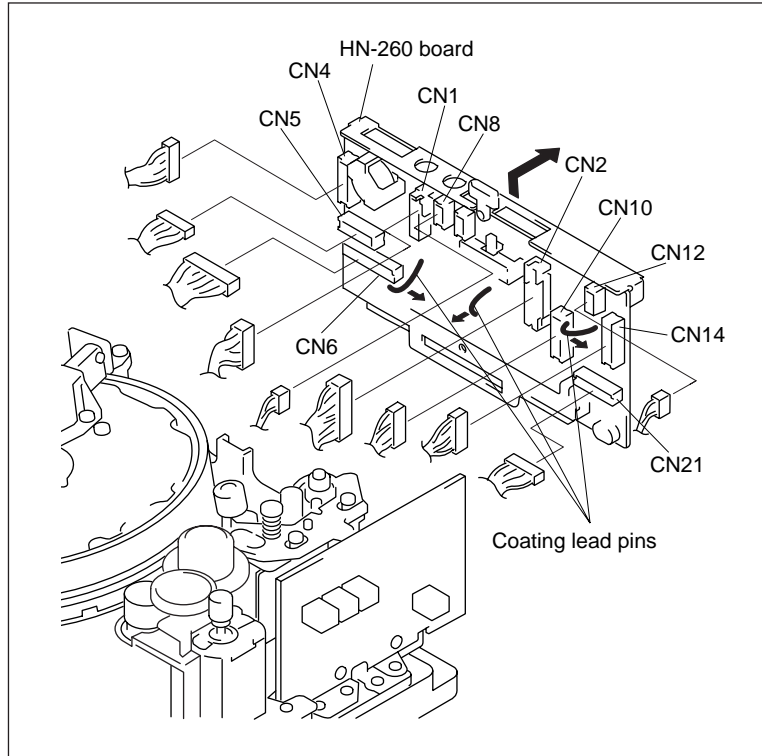
### 3-1-3. Replacing the HN-260 Board

1. Remove the outside panel.
2. Remove the mechanical deck assembly.  
(Refer to Section “4. Mechanical Deck Parts Replacement”.)
3. Untie the harnesses from the three coating lead pins.
4. Disconnect the harnesses from the ten connectors (CN1, CN2, CN4 to CN6, CN8, CN10, CN12, CN14 and CN21) on the HN-260 board to remove the board.

**Note**

It is difficult to remove these harnesses in the narrow clearance between the mechanical deck assembly and the HN-260 board.

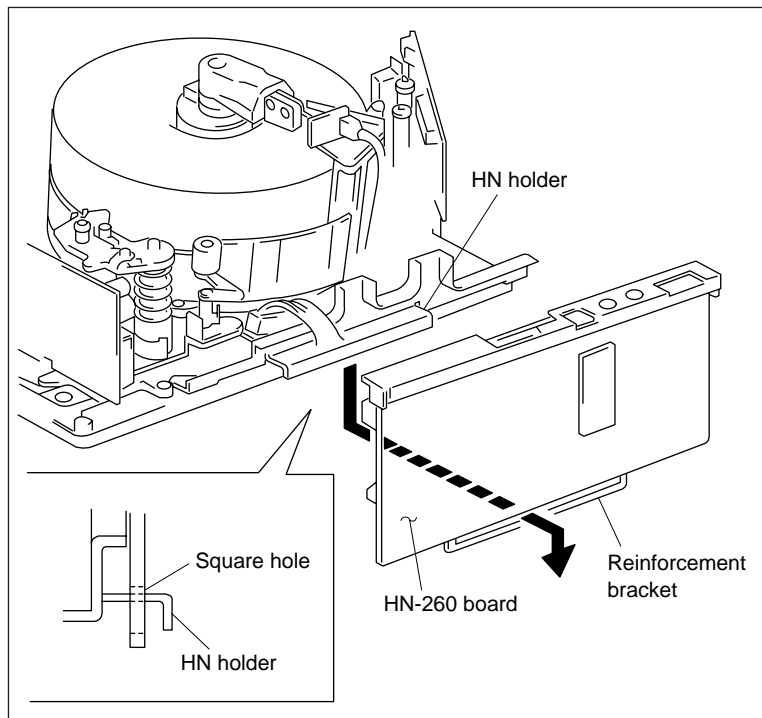
Be careful to untie the harnesses from the respective coating lead pins one after another.



5. Reinstall the HN-260 board by reversing the removing steps.

**Note**

Check that the bending portion of the HN holder of the mechanical deck assembly is put in the square hole of the reinforcement bracket attached to the HN-260 board.



### 3-1-4. Replacing the CI-20 and CI-21 Boards

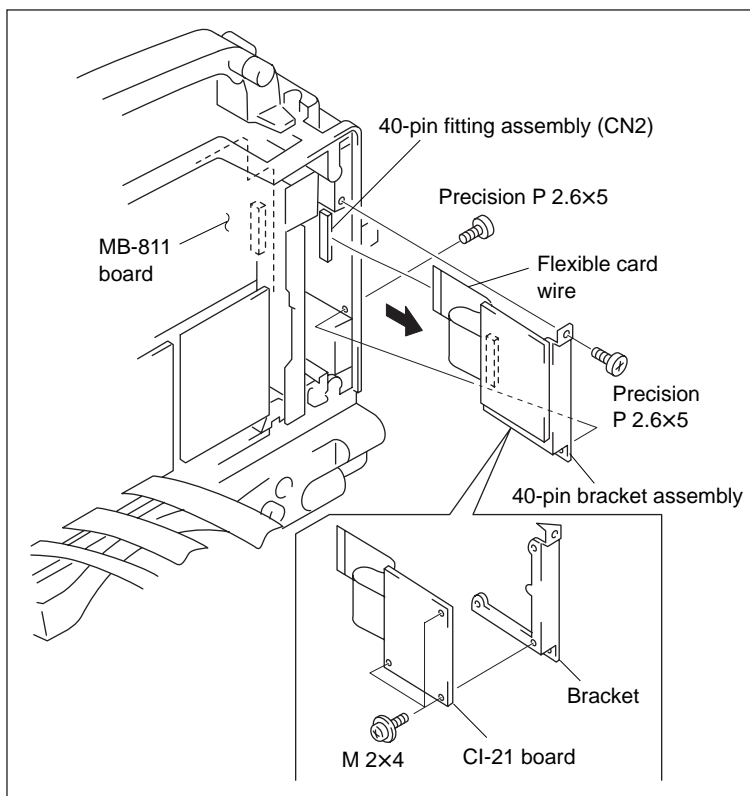
#### Removal

1. Open the inside panel.
2. Remove the two precision screws (P 2.6×5), and then disconnect and pull the 40-pin bracket assembly out from the MB-811 board.

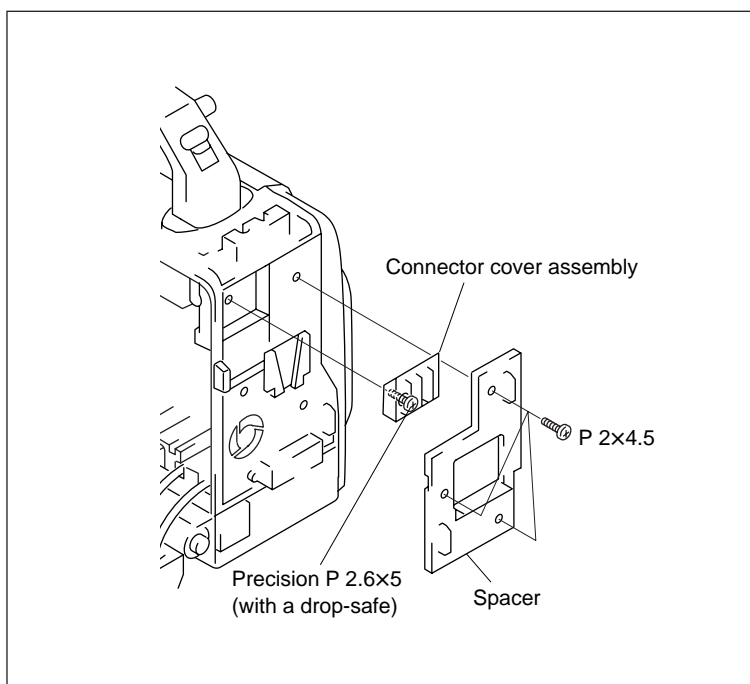
#### Note

Taking care not to damage the flexible card wire, remove the 40-pin bracket assembly.

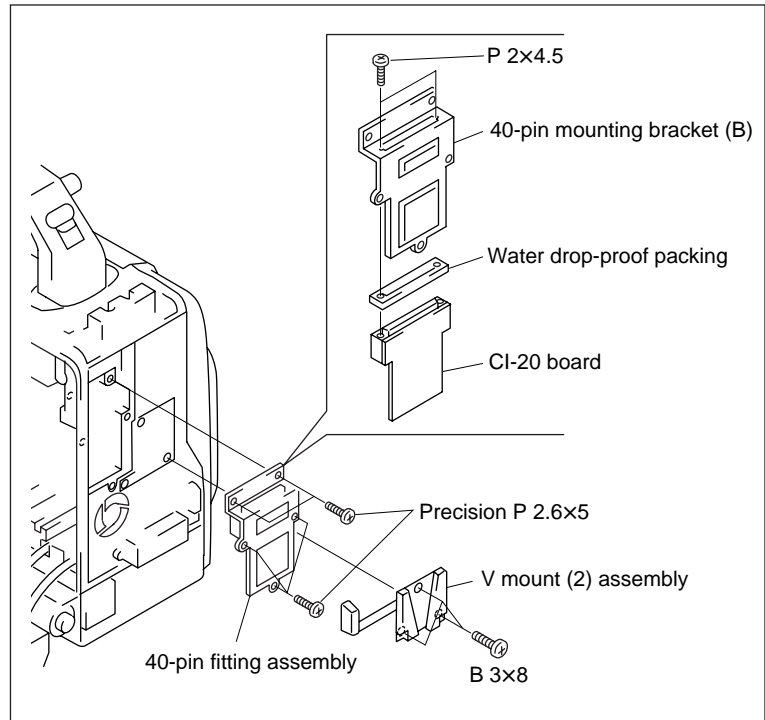
3. Disconnect the flexible card wire from the connector of the 40-pin fitting assembly.
4. Remove the three screws (M 2×4) to remove the CI-21 board from the bracket.



5. Loosen the precision screw (with a drop-safe washer, P 2.6×5) to remove the connector cover assembly.
6. Remove the three screws (P 2×4.5) to remove the spacer.



6. Remove the three screws (B 3×8) to remove the V mount (2) assembly.
7. Remove the five precision screws (P 2.6×5) to remove the 40-pin fitting assembly.
8. Remove the two screws (P 2×4.5) to remove the 40-pin mounting bracket (B) and the water drop-proof packing from the CI-20 board.



## Reinstallation

### Required tools

- 40-pin positioning tool PG-163 : J-7031-630-A
- 40-pin CN positioning tool PG-215 : J-7032-150-A

### Procedure

1. Temporarily assemble the 40-pin mounting bracket (B), the water drop-proof packing, and the CI-20 board.

#### Note

Assemble them without using screws at this state.

2. Insert one end of the 40-pin mounting bracket (B) and shell of the 40-pin connector of the CI-20 board into the PG-215 (40-pin CN positioning tool).

#### Note

Be sure to insert them positioning as shown in the figure.

3. Pull the red lever of the PG-215 toward you to retain the 40-pin mounting bracket (B) and the shell of the 40-pin connector.
4. Secure the CI-20 board to the 40-pin mounting bracket (B) using the two screws.

Standard tightening torque :

$$19 \times 10^{-2} \text{ N} \cdot \text{m} \{ 1.9 \text{ kgf} \cdot \text{cm} \}$$

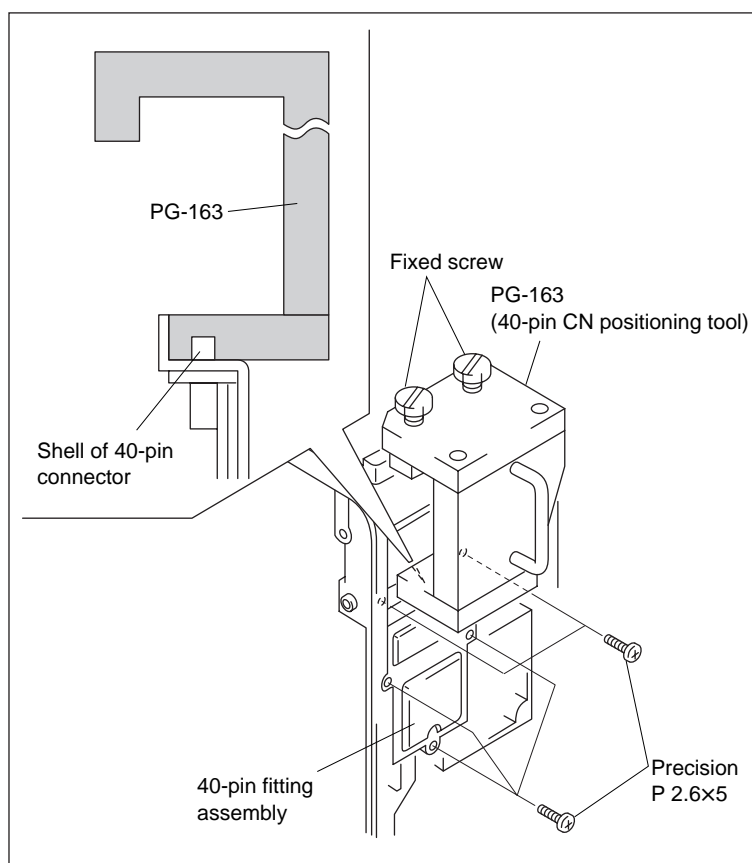
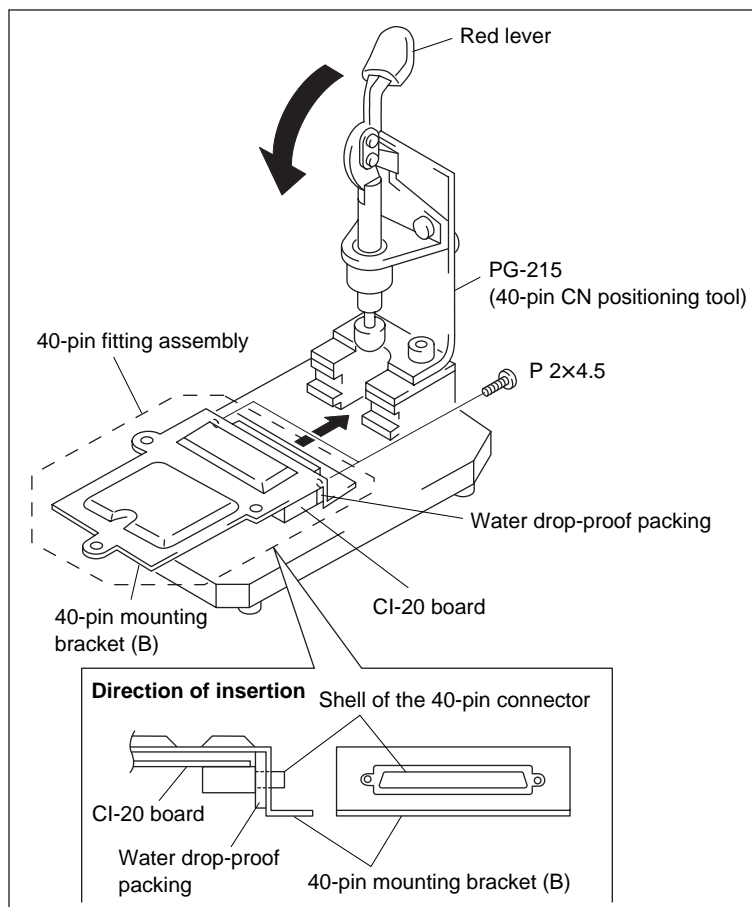
5. Align the 40-pin fitting assembly to the mounting position of the unit.
6. Align the PG-163 (40-pin CN positioning tool) to retain the shell of the 40-pin connector, and then tighten the two fixing screws on top of the PG-163.

7. Reinstall the 40-pin fitting assembly using the five precision screws.

Standard tightening torque :

$$53 \times 10^{-2} \text{ N} \cdot \text{m} \{ 5.4 \text{ kgf} \cdot \text{cm} \}$$

8. Reinstall the V mount (2) assembly, spacer, connector cover assembly, and CI-21 board by reversing the removing steps.



3-2. Replacing the CCD Unit and Its Components

3-2-1. Replacing the CCD Unit

The CCD unit used for the DVW-707/707P is different from that used for the DVW-790WS/790WSP/709WS/709WSP. However, the replacement procedure remains the same.

Note

The type of filter knobs is also different depending on the model.

Outline

| Replacement                        |
|------------------------------------|
| Removing the front assembly        |
| Removing the ND filter knob        |
| Removing the CC filter knob        |
| Removing the CCD unit              |
| Reinstalling the CCD unit          |
| Reinstalling the CC filter knob    |
| Reinstalling the ND filter knob    |
| Reinstalling the front assembly    |
|                                    |
| Adjustments after replacement      |
| Tape running adjustment            |
| Camera system electrical alignment |

Note

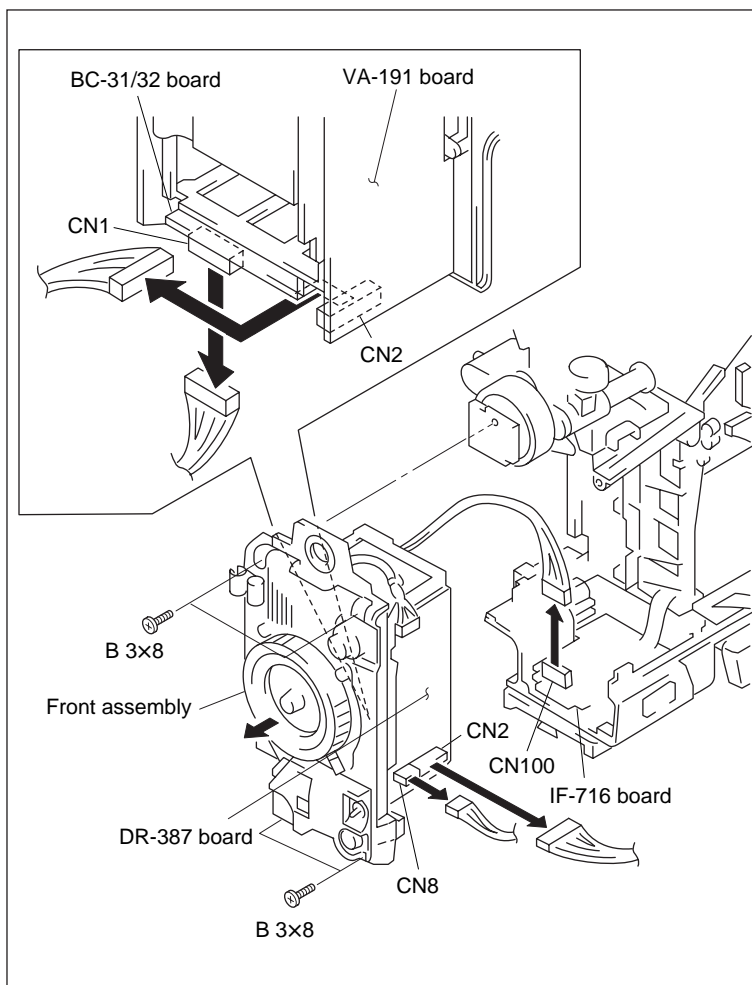
The mount ring and the mount lever are respectively available as a repair part.



## Removal

### 1. Removing the Front Assembly

- (1) Open the inside panel.
- (2) Disconnect the harnesses from the connectors (CN2 and CN8) on the DR-387 board.
- (3) Remove the outside panel.
- (4) Remove the four screws. While removing the front assembly, remove the harness from the connector (CN100) on the IF-716 board.
- (5) Disconnect the harnesses from the connector (CN2) on the VA-191 board and the connector (CN1) on the BC-31/32 board.



**Note**

The removal and reinstallation procedures of the filter knob differ depending on the model.

**2. Removing the ND Filter Knob**

DVW-790WS/790WSP/709WS/709WSP :

Loosen the two setscrews to remove the ND filter knob.

Tool : L-shaped hex. wrench (s=0.89 mm)

DVW-707/707P :

Loosen the setscrew to remove the filter knob.

Tool : L-shaped hex. wrench (s=1.5 mm)

**3. Removing the CC Filter Knob**

**(DVW-790WS/790WSP/709WS/709WSP)**

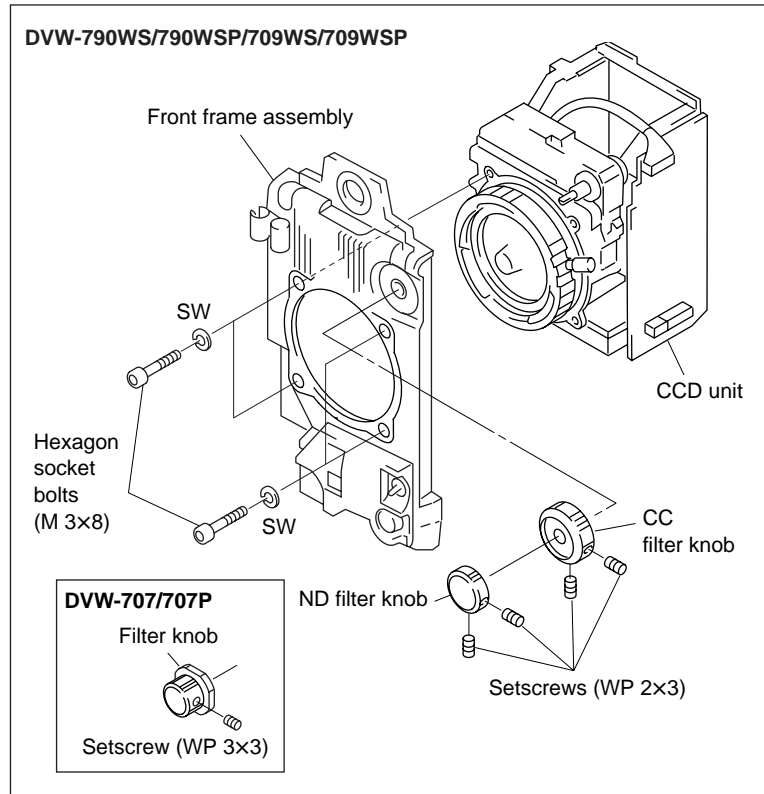
Loosen the two setscrews to remove the CC filter knob.

Tool : L-shaped hex. wrench (s=0.89 mm)

**4. Removing the CCD Unit**

Remove the four hexagon socket bolts (M 3×8) and the four washers (SW3) to remove the CCD unit from the front frame assembly.

Tool : L-shaped hex. wrench (s=2.5 mm)



## Reinstallation

### 5. Reinstalling the CCD Unit

- (1) Clean the area (■ portion in the figure) of the CCD unit, that contacts the front frame.
  - (2) Reinstall the CCD unit on the front frame assembly using the four screws.
- Standard tightening torque :  
 $80 \times 10^{-2} \text{ N}\cdot\text{m} \{8 \text{ kgf}\cdot\text{cm}\}$

### 6. Reinstalling the CC Filter Knob (DVW-790WS/790WSP/709WS/709WSP)

- (1) Turn the lever in the direction of the “Removal” arrow to remove the mount cap.

#### Note

Exercise care to avoid contacting with the filter surface after removing the mount cap.

- (2) Rotate the thick knob axis until the cross filter (grid patterned filter) can be seen when viewed from the outside front.
  - (3) Align the CC filter knob number “A” with the marking on the front panel as shown, and then tighten the two setscrews.
- Standard tightening torque:  
 $20 \times 10^{-2} \text{ N}\cdot\text{m} \{2.0 \text{ kgf}\cdot\text{cm}\}$
- (4) Rotate the CC filter knob and check that the knob rotates smoothly.

### 7. Reinstalling the ND Filter Knob

- (1) Rotate the thin knob axis until the most light-colored filter can be seen when viewed from the outside front.
- (2) Align the number “1” of the ND filter knob or the filter knob with the marking on the front panel, and then tighten the two setscrews.

Standard tightening torque

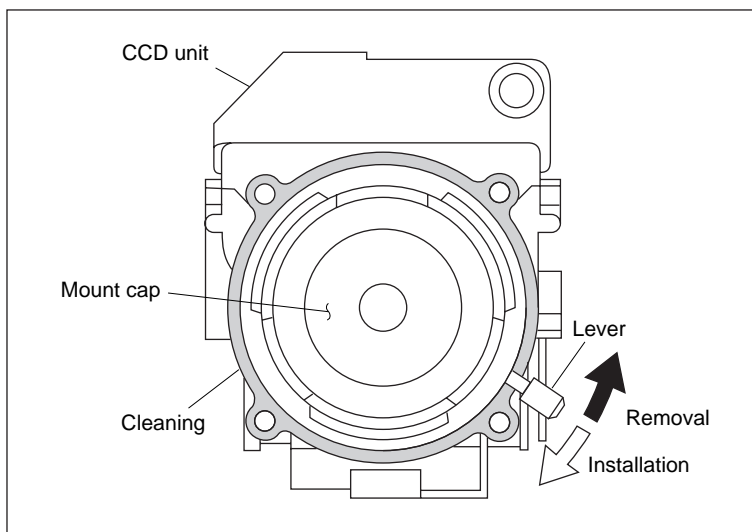
(DVW-790WS/790WSP/709WS/709WSP)

Two screws :  $20 \times 10^{-2} \text{ N}\cdot\text{m} \{2.0 \text{ kgf}\cdot\text{cm}\}$

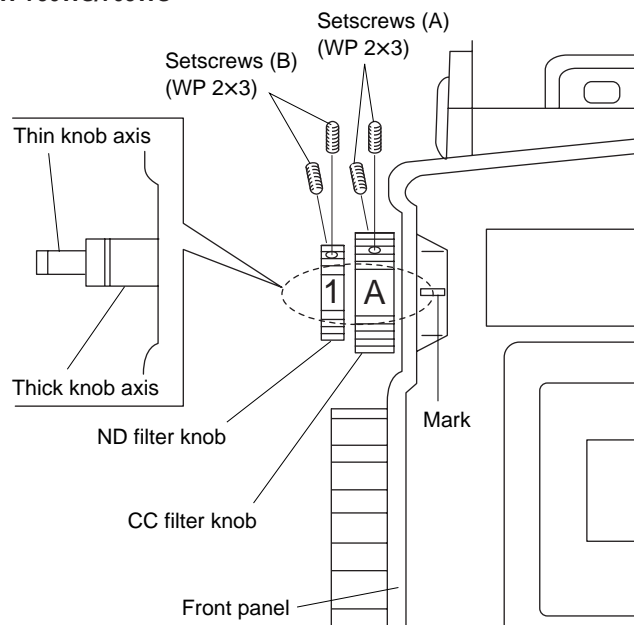
(DVW-707/707P)

Single screw :  $53 \times 10^{-2} \text{ N}\cdot\text{m} \{5.4 \text{ kgf}\cdot\text{cm}\}$

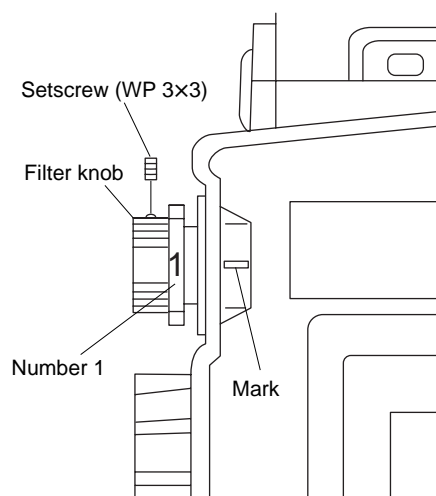
- (3) Rotate the ND filter knob or the filter knob to check that the knob rotates smoothly.
- (4) Turn the lever in the direction of the “Installation” arrow, and then reinstall the mount cap.



#### DVW-790WS/709WS



#### DVW-707



## 8. Reinstalling the Front Assembly

- (1) Ensure that the harnesses removed in step 1 is reconnected to the VA-191 board (CN2) and the BC-31/32 board (CN1).

- (2) Reinstall the front assembly using the four screws.

Standard tightening torque :

$$80 \times 10^{-2} \text{ N}\cdot\text{m} \{8 \text{ kgf}\cdot\text{cm}\}$$

### Note

Reinstalling the front assembly will mate the CN20 of the SW-971 board in the CN200 of the IF-716 board.

Ensure that these connectors are engaged securely without pressing in forcedly.

- (3) Close the inside panel, and then reattach the outside panel.

---

## Adjustment After Replacement

## 9. Tape Running Adjustment

(Refer to Section 5-1.)

## 10. Electrical Alignment

- Camera System Electrical Alignment  
(Refer to Section 4\*1 or 5\*2 in the Maintenance Manual Part 1.)
- VCO CONT Frequency Check  
(Refer to Section 7-2\*1 or 8-2\*2.)
- AD Clock Phase Adjustment  
(Refer to Section 7-3\*1 or 8-3\*2.)

\*1: For DVW-709WS/709WSP/790WS/790WSP only

\*2: For DVW-707/707P only

### 3-2-2. Replacing the Filter Disk Unit (DVW-790WS/790WSP/709WS/ 709WSP only)

#### Notes

- The filter disk unit used in the DVW-707/707P cannot be removed because it is built into a single body with the CCD unit.
- Be sure to replace the filter disk unit in a dust-free atmosphere such as a clean room.

#### Removal

1. Remove the CCD unit.  
(Refer to Section 3-2-1.)
2. Remove the two screws and disconnect the harness from the connector (CN3) on the DR-387 board, and then slowly lift the filter disk unit out.

#### Reinstallation

1. Reinstall the new filter disk unit using the two screws removed in step 2 of the removal procedure. And then reconnect the harness of the filter disk unit to the connector (CN3) on the DR-387 board.

#### Note

Do not contact the surface of the filter disk unit during installation.

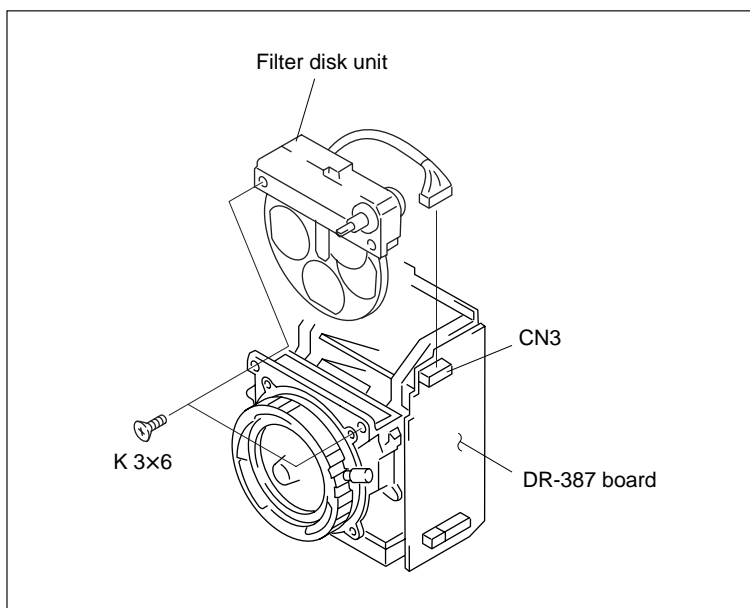
2. Reinstall the CCD unit on the front frame assembly using the four hexagon socket bolts.  
Standard tightening torque :  
 $80 \times 10^{-2} \text{ N}\cdot\text{m} \{8 \text{ kgf}\cdot\text{cm}\}$
3. Reinstall the CCD unit.  
(Refer to Section 3-2-1.)

#### Adjustment After Replacement

Adjustment after Filter Disk Unit Replacement  
(Refer to Section 7-21\*<sup>1</sup> or 8-20\*<sup>2</sup>.)

\*1: For DVW-790WS/790WSP/709WS/709WSP only

\*2: DVW-707/707P only



### 3-2-3. Replacing the Boards Inside the CCD Unit

**Note**

The numbers in the figure indicate the order of the procedure.

#### 1. Removing the CCD Unit

Refer to Section “3-2-1. Replacing the CCD unit”.

#### 2. Removing the DR-387 Board

- (1) Disconnect the harness from the connector (CN3) on the DR-387 board.
- (2) DVW-790WS/790WSP/709WS/709WSP :  
Remove the two precision screws (M 1.4×3.5), and the two hexagonal supports.  
DVW-707/707P :  
Remove the two precision screws (M 1.4×3.5), and the screw (B 3×5).
- (3) Disconnect the connection of the CN2 on the BC-31/32 boards, CN1 on the CN-1183 board, and CN2 and CN3 on the TG-206/207 boards to remove the DR-387 board.

#### 3. Removing the TG-206/207 Boards

Disconnect the connection of the CN5 on the PA-228 board to remove the TG-206/207 boards.

#### 4. Removing the BC-31/32 Boards

Disconnect the connection of the CN4 and CN7 on the PA-228 board to remove the BC-31/32 boards.

#### 5. Removing the VA-191 Board

Remove the three precision screws (M 1.4×3.5) and disconnect the connection of the CN8 on the PA-228 board to remove the VA-191 board.

#### 6. Removing the PA-228 Board

Remove the three precision screws (M 1.4×3.5) and disconnect the harnesses from the three connectors (CN1 to CN3) to remove the PA-228 board.

#### 7. Removing the CN-1183 Board

- (1) Remove the four precision screws (P 2×6) to remove the CHB stay.
- (2) Disconnect the flexible card wire from the three connectors (CN2 to CN4) on the CN-1183 board.

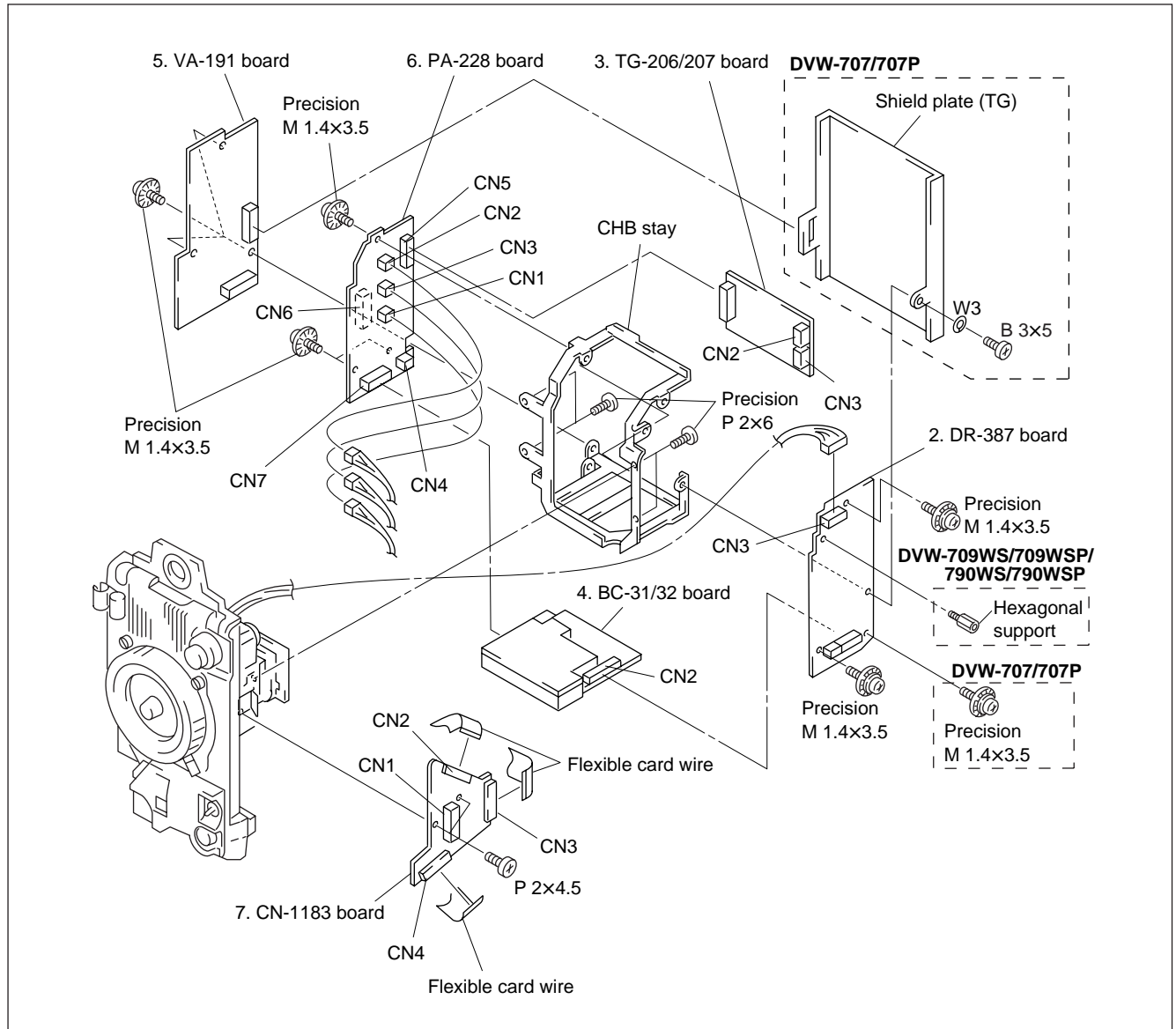
**Note**

Be careful not to fold the flexible card wires.

- (3) Remove the two screws (P 2×4.5) to remove the CN-1183 board.

**Note**

Reattach the boards by reversing the removing steps.



### 3-3. Replacing the External Connectors/Switches

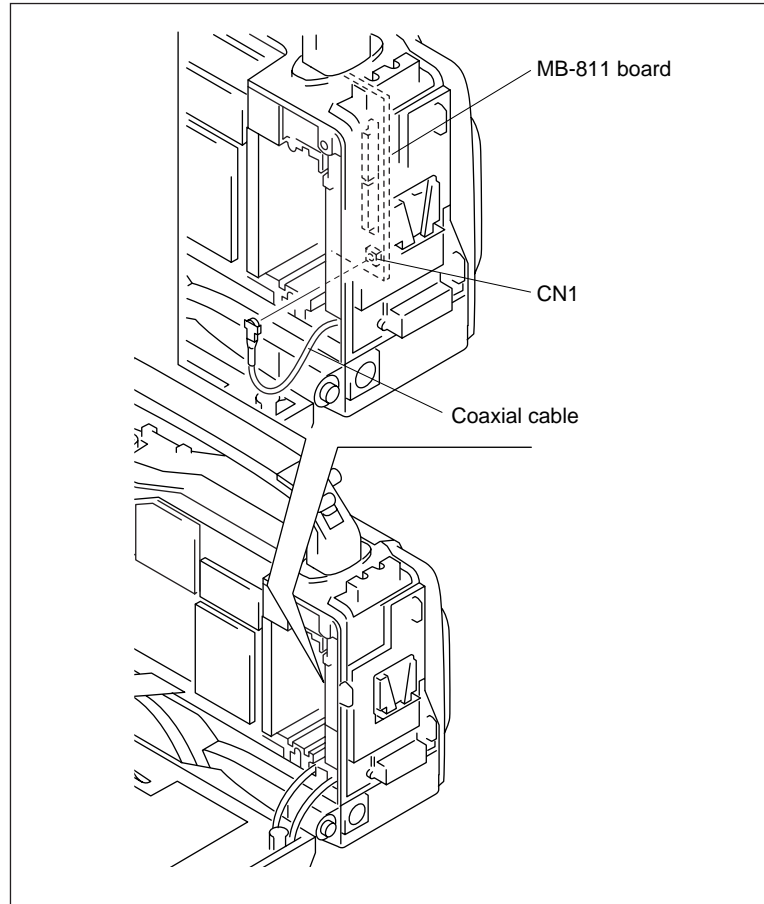
#### 3-3-1. AUDIO IN, AUDIO OUT (CH1, CH2), DC IN, DC OUT Connectors

##### 1. Removing the Connector Box Assembly

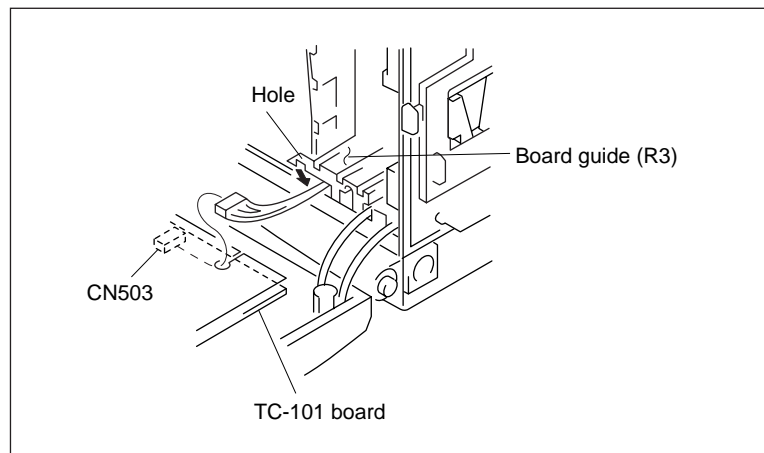
- (1) Remove the outside panel.
- (2) Open the inside panel.
- (3) Disconnect the coaxial cable from the connector (CN1) on the MB-811 board.

**Note**

If the optional DIF-75 board (BKDW-702) is installed, disconnect the coaxial cable from the DIF-75 board and pull the board out first. And then perform step 3.

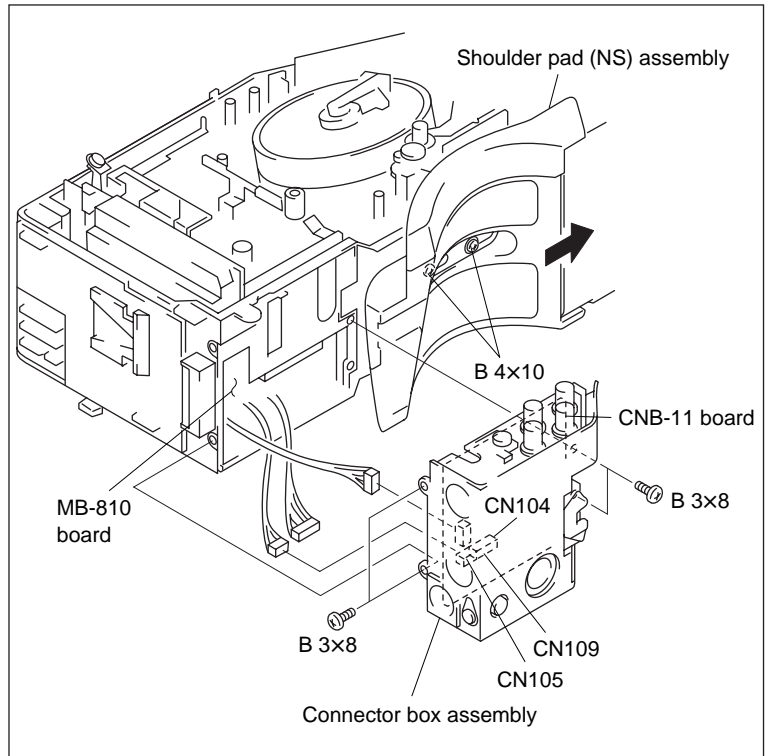


- (4) Disconnect the harness from the connector (CN503) on the TC-101 board and remove the harness through the hole of the board guide (R3).





- (5) Loosen the two screws (B 4×10) on the shoulder pad (NS) assembly.
- (6) Move the shoulder pad (NS) assembly in the direction of the arrow.
- (7) Remove the four screws (B 3×4). Disconnect the connection to the MB-810 board to remove the connector box assembly.
- (8) Disconnect the harnesses from the three connectors (CN104, CN105 and CN109) on the CNB-11 board.



## 2. Removing the CNB-11 Board

Remove the three screws (M 2×4) and the harnesses from the seven connectors (CN35, CN50, CN102, CN103, CN106, CN107 and CN108) to remove the CNB-11 board.

## 3. Removing the CNB Stay

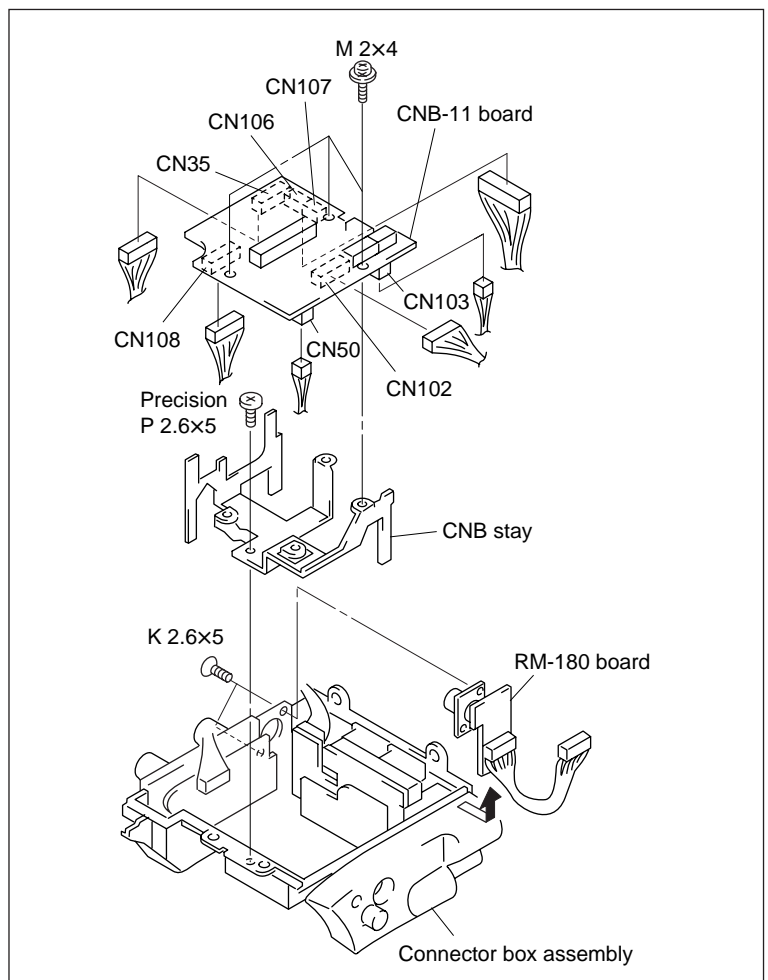
Remove the precision screw (P 2.6×5) to remove the CNB stay.

### Note

Be careful not to damage the harnesses around the CNB stay.

## 4. Removing the RM-180 Board

Remove the two screws (K 2.6×5) to remove the RM-180 board.

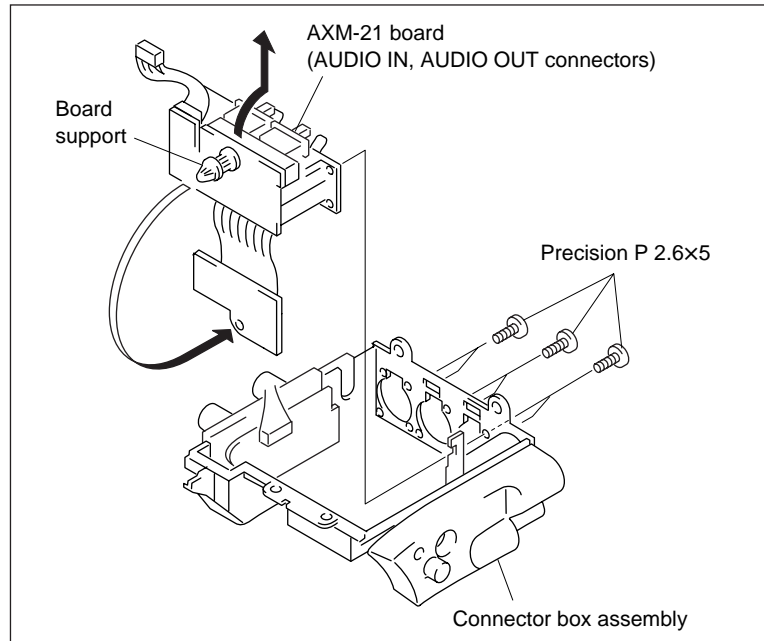


## 5. Removing the Connector

Refer to the following replacement procedure of each connector depending on the connector. Reattach the connector by reversing the removing steps.

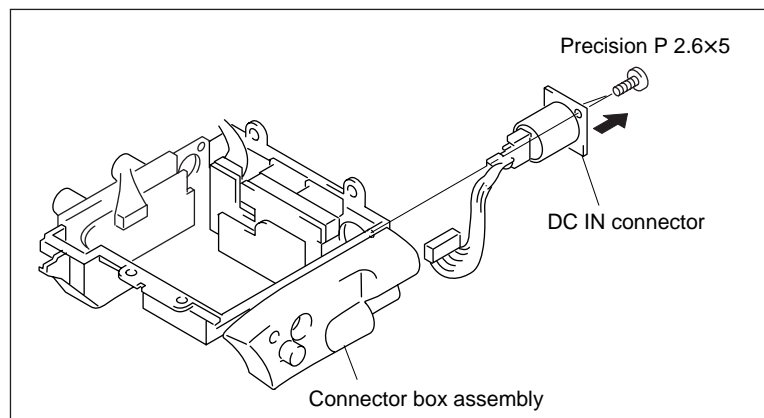
### • AUDIO IN/AUDIO OUT connector

- (1) Remove the six precision screws to remove the AXM-21 board.
- (2) Hold the cap of the board support with tweezers and press it to shrink. Remove the cap from the board opening to remove the AXM-21 board.
- (3) Remove soldering from the AUDIO IN/AUDIO OUT connectors to remove them.



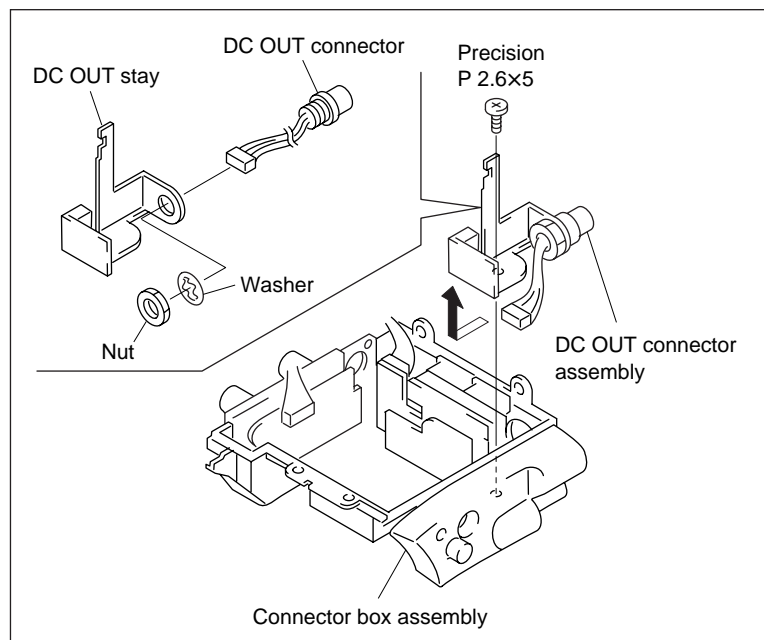
### • DC IN connector

Remove the two precision screws to remove the DC IN connector.



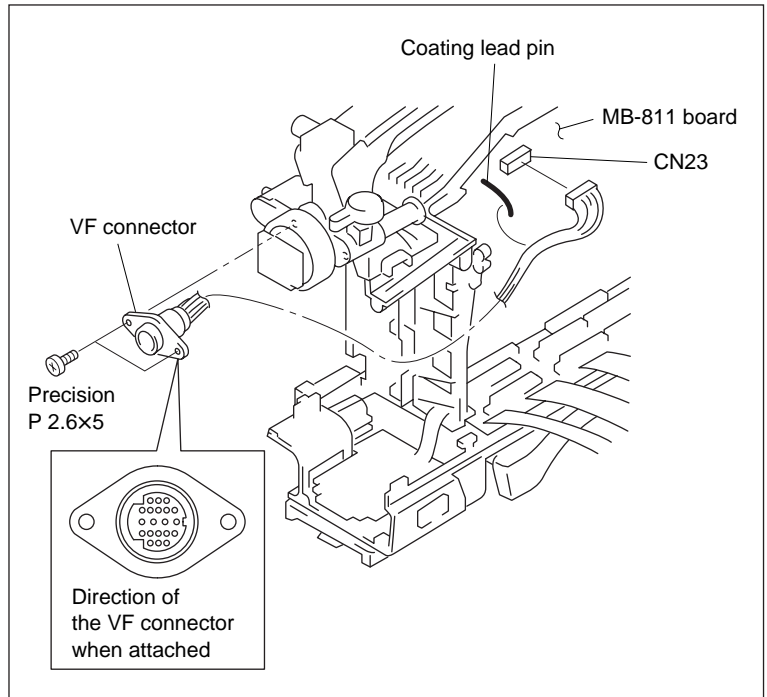
### • DC OUT connector

- (1) Remove the precision screw to remove the DC OUT connector assembly.
- (2) Remove the nut and washer, and then remove the DC OUT connector from the DC OUT stay.



### 3-3-2. VF Connector

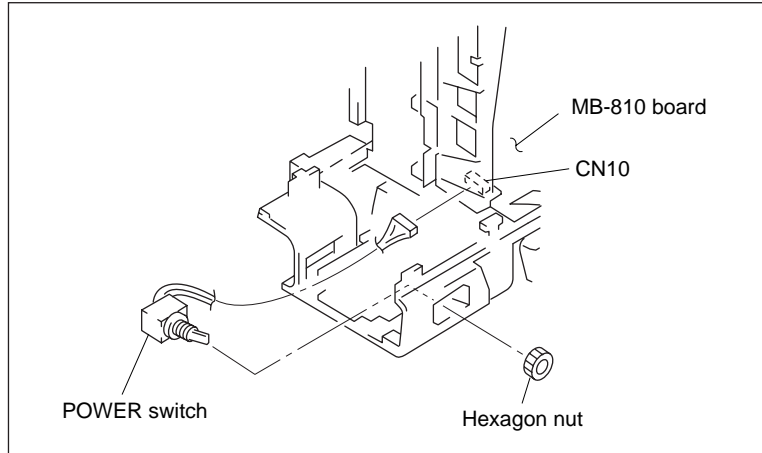
1. Pull the plug-in boards (DCP and DVP board assemblies) out. (Refer to the Maintenance Manual Part 1, Section 1-9.)
2. Remove the CCD unit. (Refer to Section “3-2-1. Replacing the CCD unit”.)
3. Untie the harness from the coating lead pin, and then disconnect the harness from the connector (CN23) on the MB-811 board.
4. Remove the two precision screws, and then pull the VF connector out.
5. Reattach the VF connector by reversing the removing steps.



### 3-3-3. POWER Switch, MIC IN Connector

#### POWER Switch

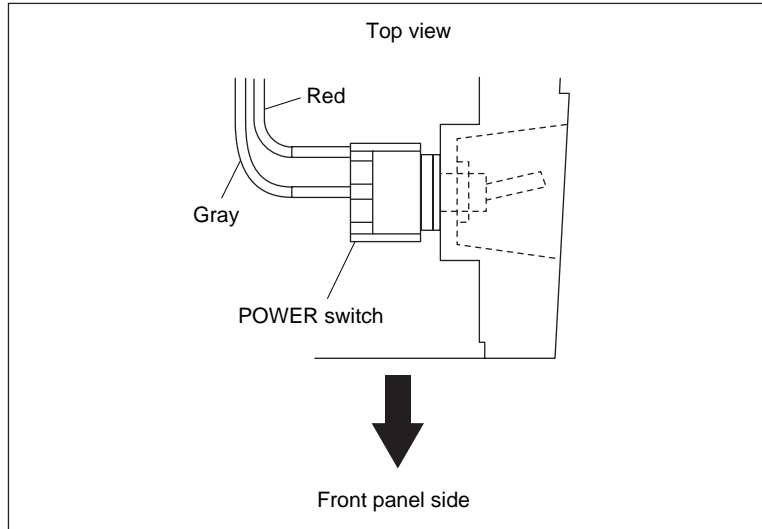
1. Remove the front assembly. (Refer to Section “3-2-1. Replacing the CCD Unit”.)
2. Disconnect the harness from the connector (CN10) on the MB-810 board.
3. Remove the hexagon nut to remove the POWER switch.



4. Reattach the POWER switch by reversing the removing steps.

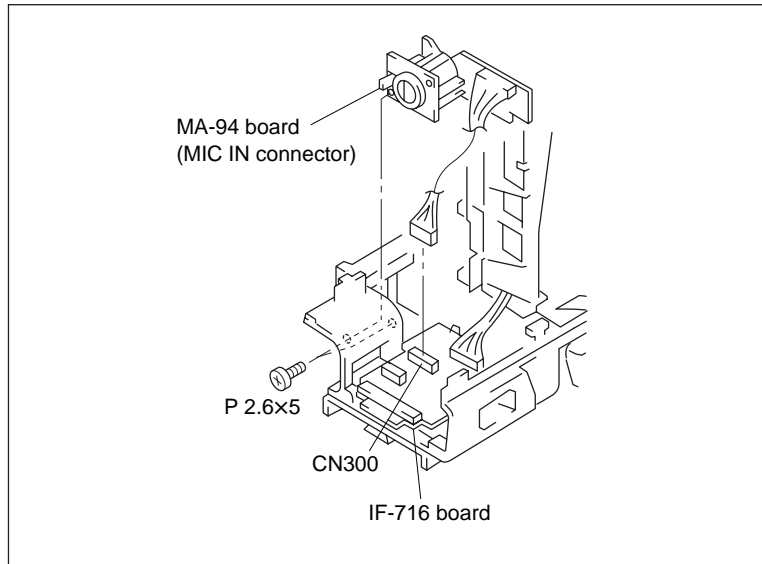
#### Note

Reinstall the POWER switch as shown in the figure (viewed from above).



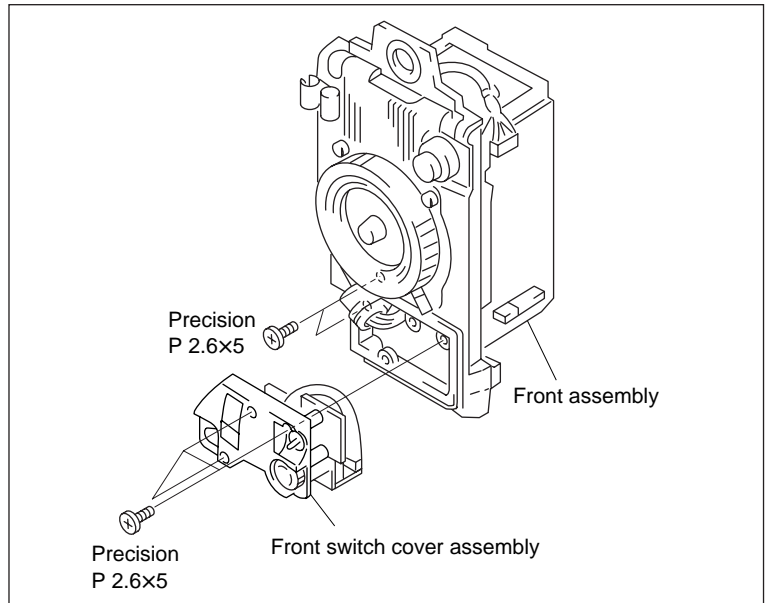
#### MIC IN Connector

1. Remove the POWER switch. (Refer to Section 3-3-3.)
2. Disconnect the harness from the connector (CN300).
3. Remove the two screws to remove the MA-94 board.
4. Remove soldering from the MIC IN connector to remove the connector.
5. Reattach the MIC IN connector by reversing the removing steps.

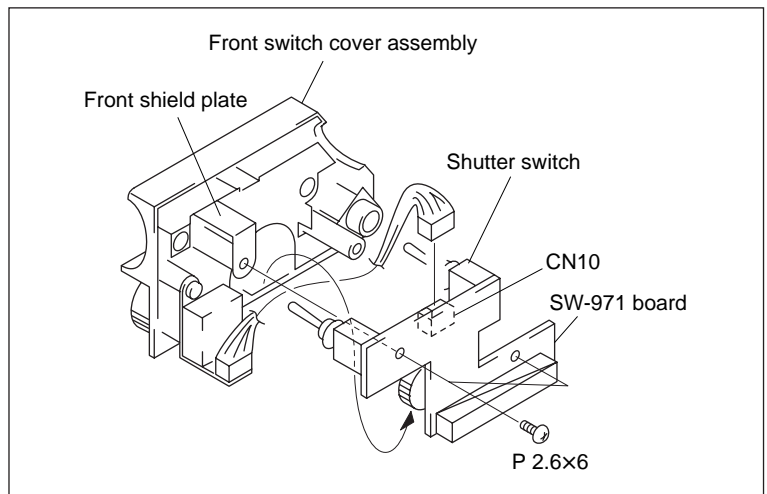


### 3-3-4. Shutter Switch

1. Remove the front assembly. (Refer to “3-2-1. Replacing CCD unit”.)
2. Remove the two precision screws fixing the lens connector and the three precision screws to remove the front switch cover assembly.



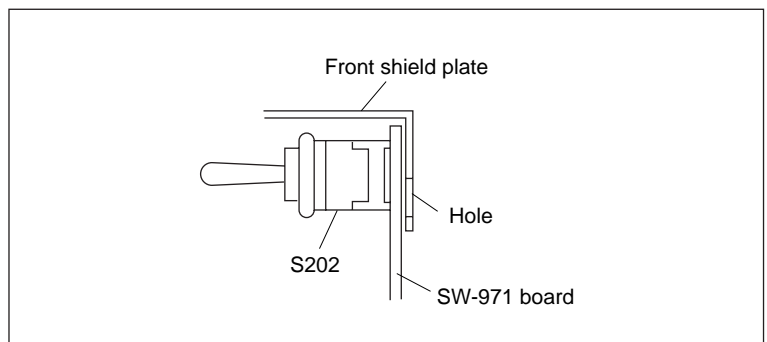
3. Disconnect the harness from the connector (CN10) on the SW-971 board.
4. Remove the two screws to remove the SW-971 board.
5. Remove soldering from the shutter switch to remove the switch from the SW-971 board.



6. Reattach the shutter switch by reversing the removing steps.

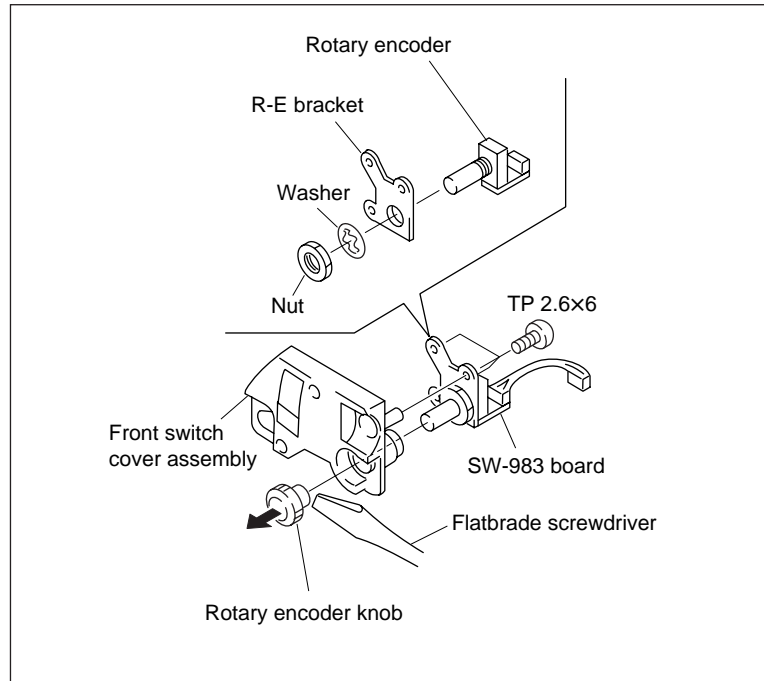
**Note**

Reattach the SW-971 board while the hole of the front shield plate is positioned on the back of the SW-971 board.



### 3-4. Replacing the Rotary Encoder

1. Remove the front assembly. (Refer to Section “3-2-1. Replacing the CCD Unit”.)
2. Remove the SW-971 board. (Refer to Section “3-3-4. Shutter Switch”.)
3. Insert a flatbrade screwdriver into the clearance between the rotary encoder knob and the front switch cover assembly. And then remove the rotary encoder knob by pushing it out with the screwdriver.
4. Remove the three screws to remove the SW-983 board.
5. Remove the nut and the washer to remove the rotary encoder (SW-983 board) from the R-E bracket.
6. Reattach the rotary encoder by reversing the removing steps.



## 3-5. Replacing the DC Fans

### 3-5-1. Upper DC Fan

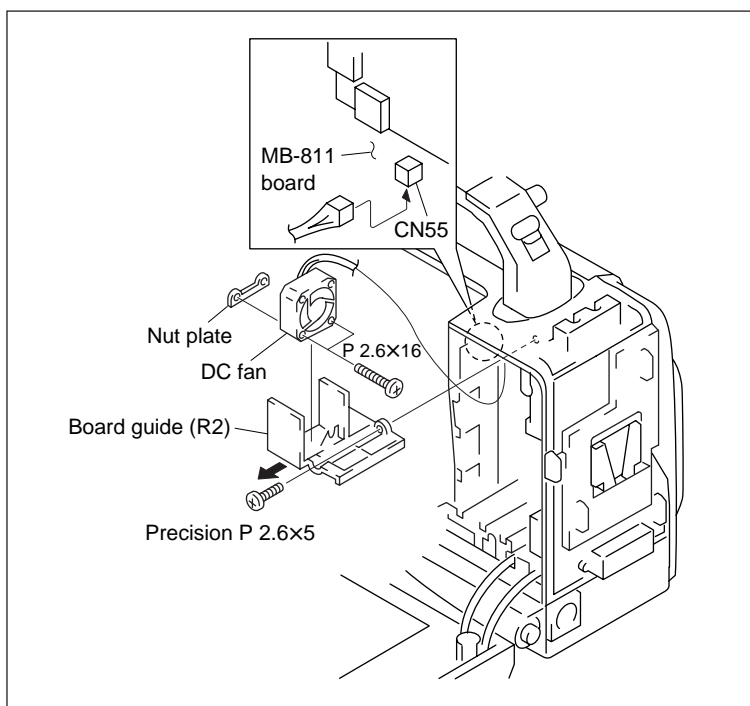
#### Note

The bearing of the DC fan is a precision part. Be careful not to grasp the fan by its blade, bump, and drop it.

Unduly shock may damage the bearing, that can result in abnormal noise during the fan operation.

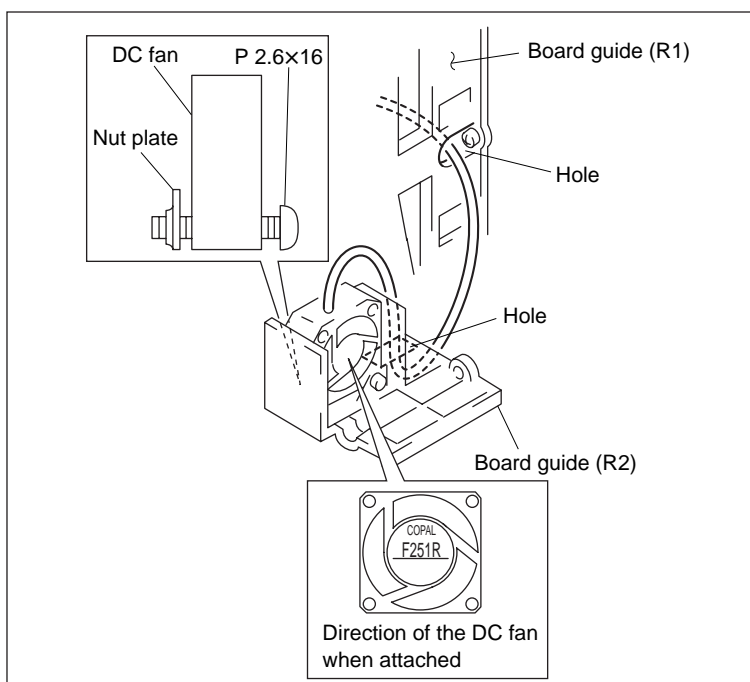
#### Removal

1. Pull the plug-in boards (DCP and DVP board assemblies) out. (Refer to the Maintenance Manual Part 1, Section 1-9.)
2. Disconnect the harness from the connector (CN55) on the MB-811 board.
3. Remove the precision screw (P 2.6×5) to remove the board guide (R2).
4. Loosen the two screws (P 2.6×16), and then remove the DC fan and plate nut.



#### Reinstallation

1. While the plate nut is attached loosely to the DC fan with the two screws, attach the DC fan onto the board guide (R2).
2. Tighten the two screws attached loosely in step 1.
3. Route the harness of the DC fan through the hole of the board guide (R2) and also through the hole of the board guide (R1).
4. Reattach the DC fan by reversing the removing steps.



### 3-5-2. Lower DC Fan

1. Open the inside panel.

**Note**

If the optional DIF-75 board (BKDW-702) has been installed, disconnect the coaxial cable from the connector (CN2) on the DIF-75 board. And then pull the DIF-75 board out.

2. Remove the three screws (P 2×4.5) to remove the spacer.
3. Remove the two screws (P 2.6×16) to remove the DC fan, cushion, and nut plate.

**Note**

The cushion is not used in the following serial numbers and higher.

DVW-707 : 10031 and higher  
 DVW-707P : 40071 and higher  
 DVW-709WS : 10046 and higher  
 DVW-709WSP : 40121 and higher  
 DVW-790WS : 10036 and higher  
 DVW-790WSP : 40126 and higher

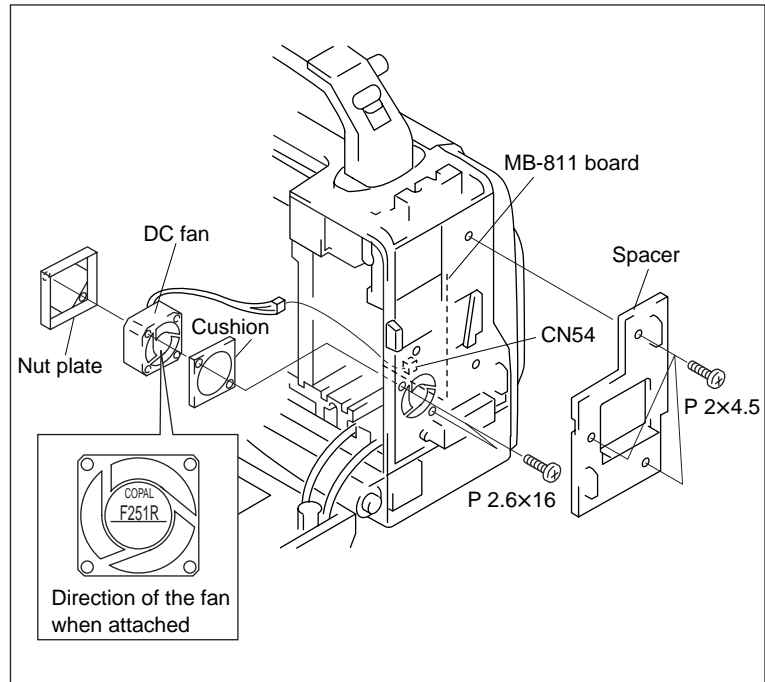
4. Disconnect the harness from the connector (CN54) on the MB-811 board.
5. Reattach the DC fan by reversing the removing steps.

Standard tightening torque :

$$8 \times 10^{-2} \text{ N} \cdot \text{m} \{0.8 \text{ kgf} \cdot \text{cm}\}$$

**Note**

Take care that the harness does not touch the fan's blade and is not routed across the fan.

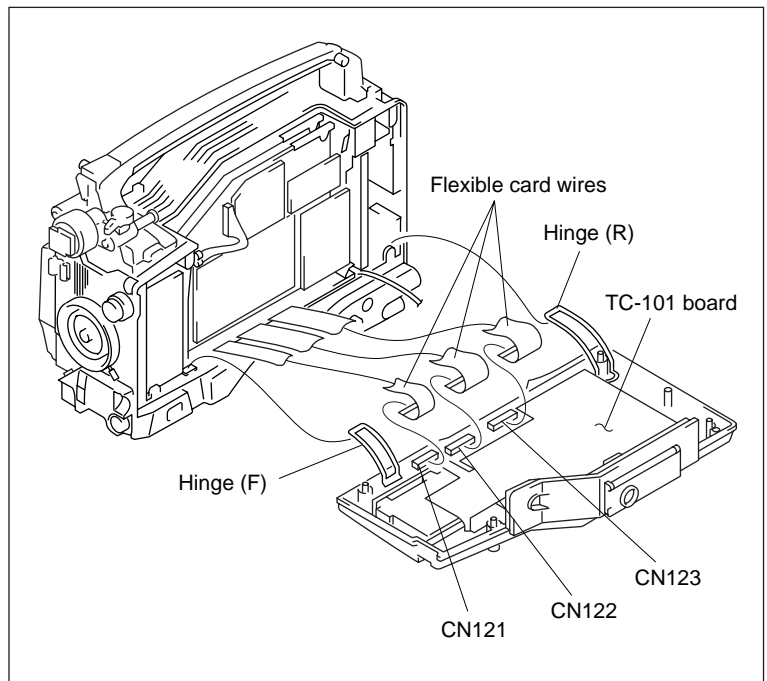
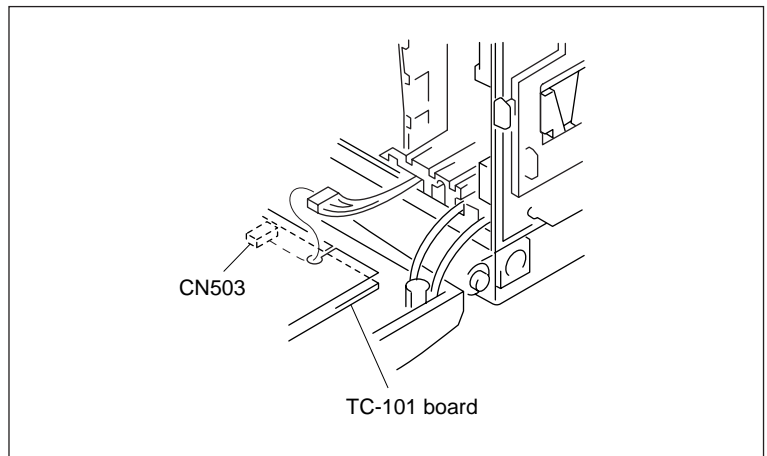




### 3-6. Replacing the Camera SW Ornamental Plate

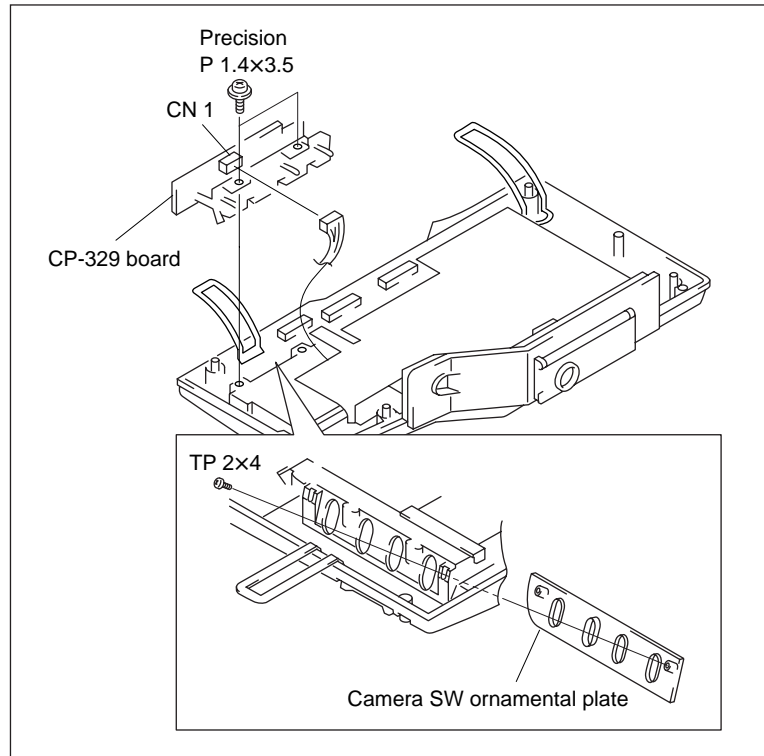
#### Removal

1. Open the inside panel.
2. Disconnect the harness from the connector (CN503) on the TC-101 board.
3. Disconnect the three flexible card wires from the connectors (CN121 to CN123) on the TC-101 board.
4. Remove the hinges (F) and (R) from the unit, and then remove the inside panel.



### 3-6. Replacing the Camera SW Ornamental Plate

5. Disconnect the harness from the connector (CN1) on the CP-329 board.
6. Remove the two precision screws (P 1.4×3.5) to remove the CP-329 board.
7. Remove the two screws (TP 2×4) to remove the camera SW ornamental plate.

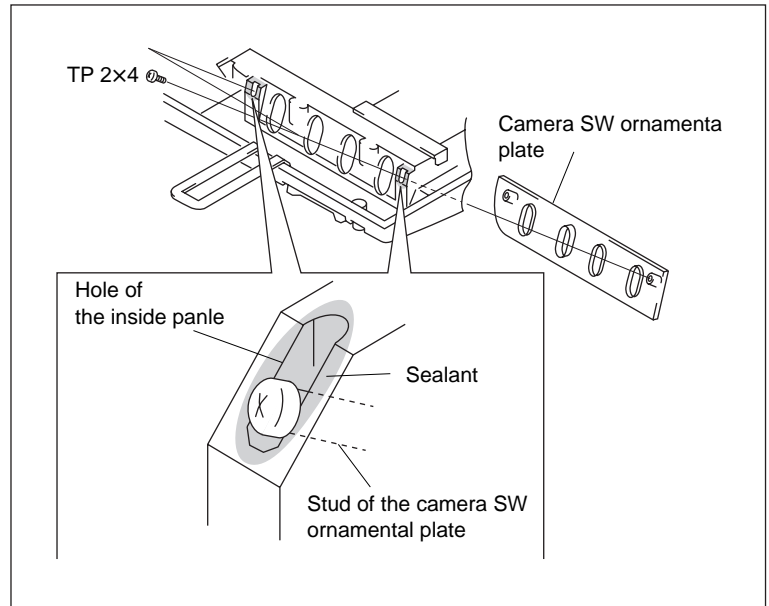


## Removal

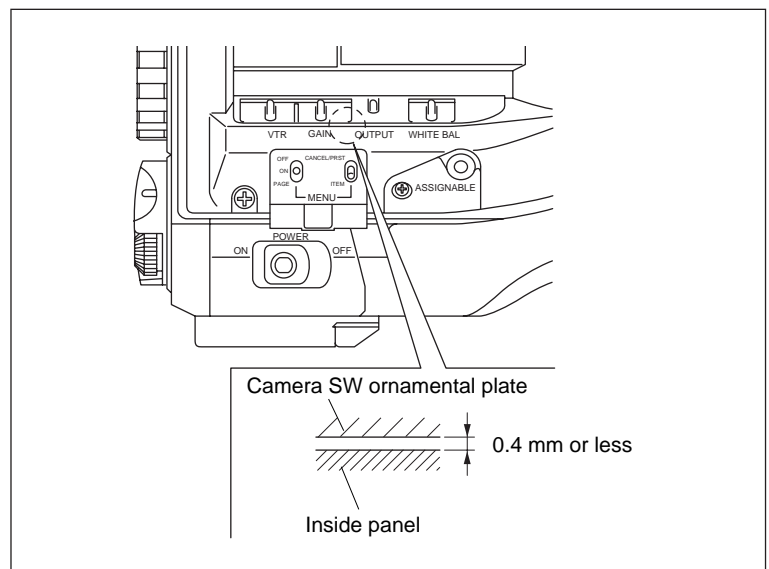
### Required tool

- Sealant TSE-392W : 7-432-950-03

1. Remove the remaining old sealant from the surface of the inside panel (▢ portion in the figure) using a flatblade screwdriver.
2. Reattach the camera SW ornamental plate to the inside panel using the two screws.  
Standard tightening torque :  
 $15 \times 10^{-2} \text{ N}\cdot\text{m}$  { 1.5 kgf·cm }
3. Apply a sufficient amount of sealant from through inside the inside panel until the hole and the stud (▢ portion in the figure) are covered by the sealant.



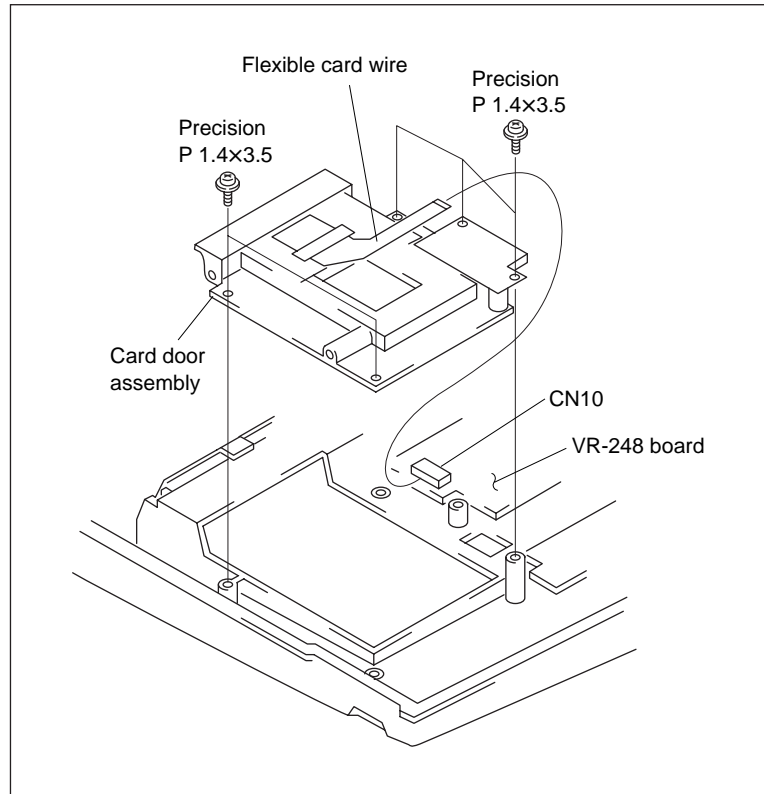
4. Check that the clearance between the camera SW ornamental plate and the inside panel is 0.4 mm or less when checked from the outside.
5. Reattach the CP-329 board and the inside panel by reversing the removing steps.



## 3-7. Replacing the Card Door Assembly

### Removal

1. Open the inside panel.
2. Disconnect the flexible card wire from the connector (CN10) on the VR-248 board.
3. Remove the five precision screws to remove the card door assembly.



### Reinstallation

#### Required tool

- Sealant TSE-392W : 7-432-950-03

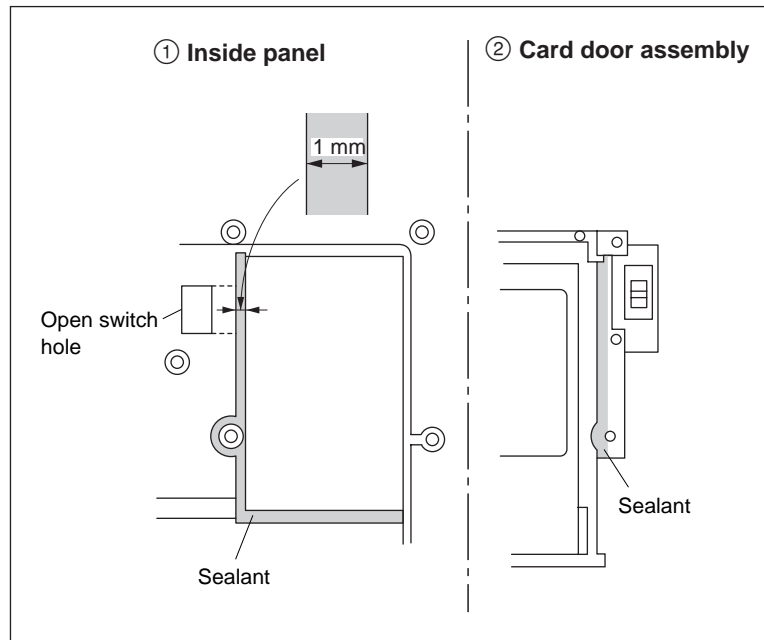
1. Remove the remaining old sealant from the surface of the inside panel (■ portion in the figure) using a flatblade screwdriver.
2. Apply the sealant to the ■ areas in the figures “① Inside panel” and “② Card door assembly” as shown, to a width of 1 to 2 mm.

#### Note

As for the areas nearby the hole for the open switch, be careful not to exceed 1 mm of the width of applying sealant.

Take care not to ooze the sealant to the outside surface. If it is out, wipe the sealant off.

3. Reattach the card door assembly by reversing the removing steps.  
 Standard tightening torque :  
 $10 \times 10^{-2} \text{ N}\cdot\text{m} \{1.0 \text{ kgf}\cdot\text{cm}\}$



## 3-8. Replacing the 40-pin Fitting Assembly

Refer to Section “3-1-4. Replacing the CI-20 and CI-21 Boards”.

## Section 4

### Mechanical Deck Parts Replacement

#### 4-1. General Information for Parts Replacement and Adjustment

##### 4-1-1. Notes

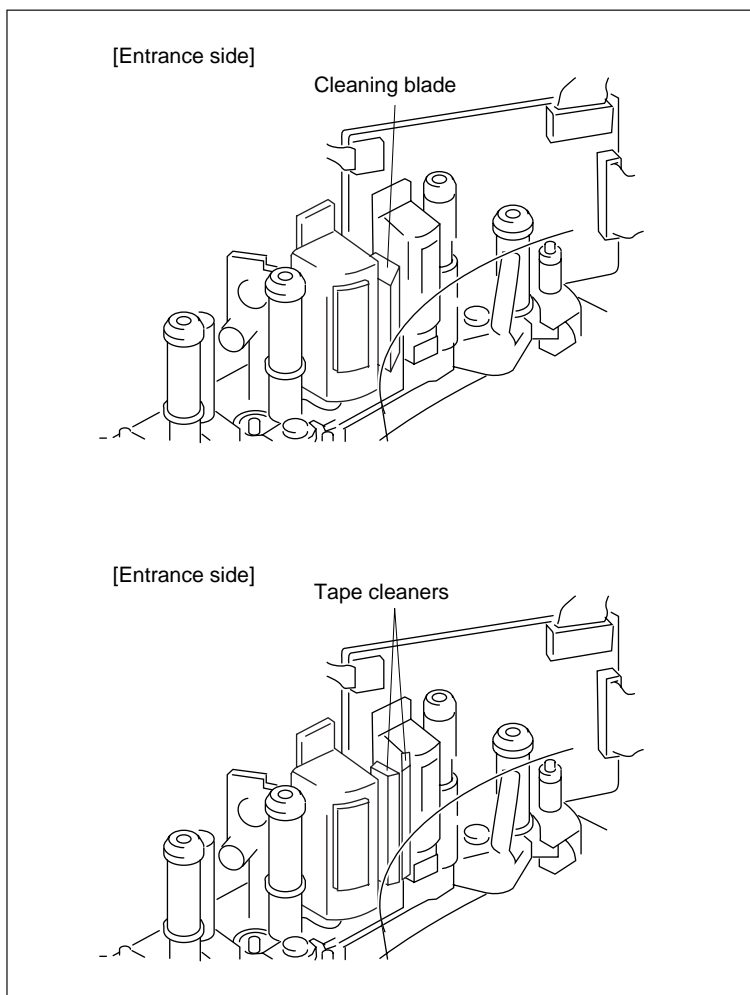
##### 1. About Cleaning Blade (Tape Cleaner depending on model)

Never touch to the cleaning blade that is attached to the erase head with bare hand.

It is in danger of cutting your finger because the cleaning blade has a sharp edge. When replacing or adjusting the parts around the cleaning blade, take care it.

##### 2. About Tools

- Before using a tool, be sure to clean the surface of it.
  - Cleaning cloth : 3-184-527-01
  - Cleaning fluid : 9-919-573-01
- Take care not to scratch the tool when using it.  
If scratching the tool, the adjustment can not be correctly carried out.



## 4-1-2. Threading End/Unthreading End Mode

### 1. Threading End Mode

Threading end mode means that S and T sliders move from around the reel tables to both sides of the drum, and stop at the cut portions like a V of catchers S and T.

#### Selection Procedures into the Threading End Mode With a Tape

- Insert a cassette tape in the cassette compartment.
- Close the front lid.

#### Selection Procedures into the Threading End Mode Without a Tape

- Place the cassette compartment into the down state.  
(When the cassette compartment does not attach to the unit, interrupt the cassette compartment lock switch (photo interrupter) on the SE board using a black paper or equivalent.)
- Press the cassette in switch about 1 second in this state while pressing the four switches of the sensor (A).

### 2. Unthreading End Mode

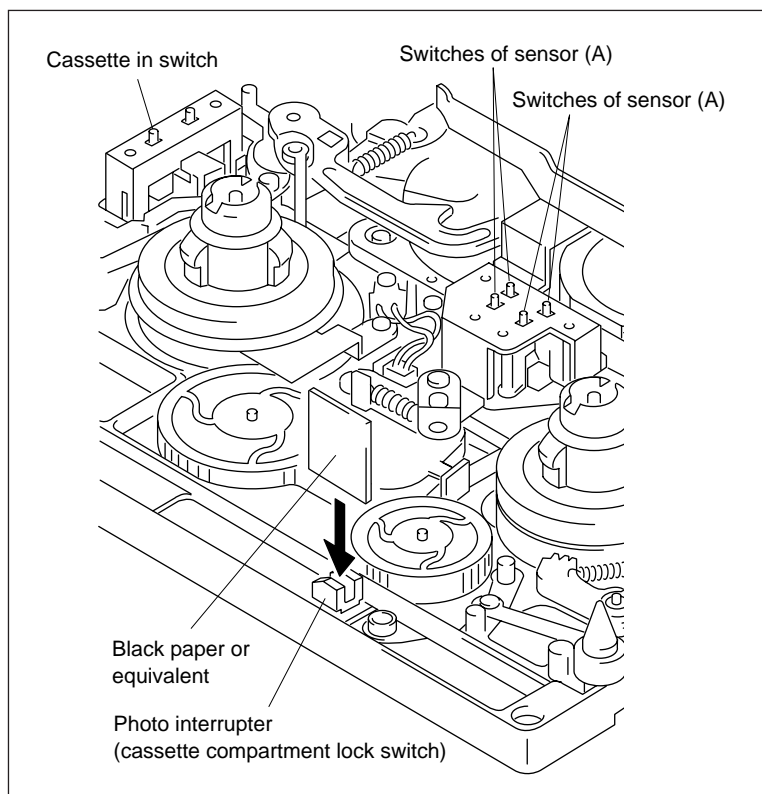
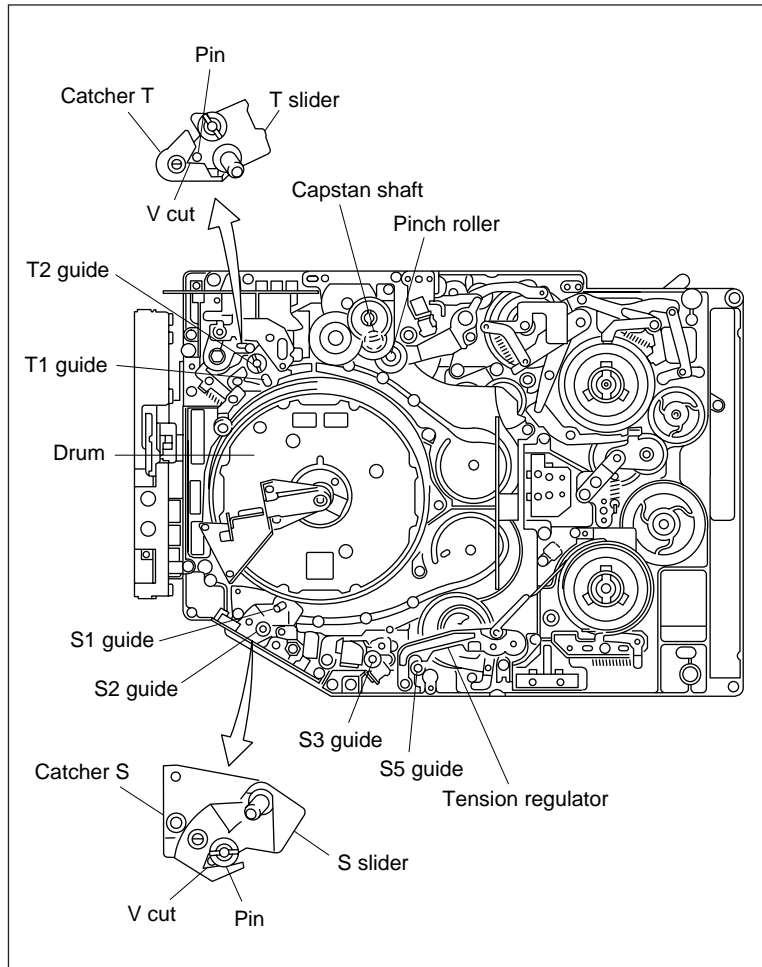
Unthreading end mode means that the S and T sliders move from the catchers S and T to the directions of the reel tables, and stop.

The unthreading end mode is the same as the ST/BY mode.

If selecting the unit into this mode, the cassette compartment will raise up.

#### Selection Procedure into the Unthreading End Mode

Press the EJECT button.



### 4-1-3. Manual Eject Assembly Removal/Installation

#### Removal

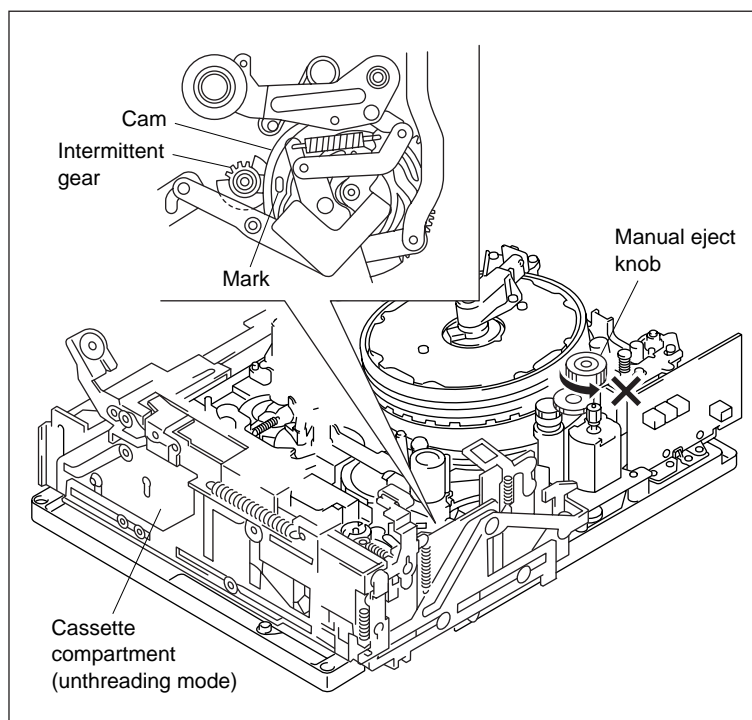
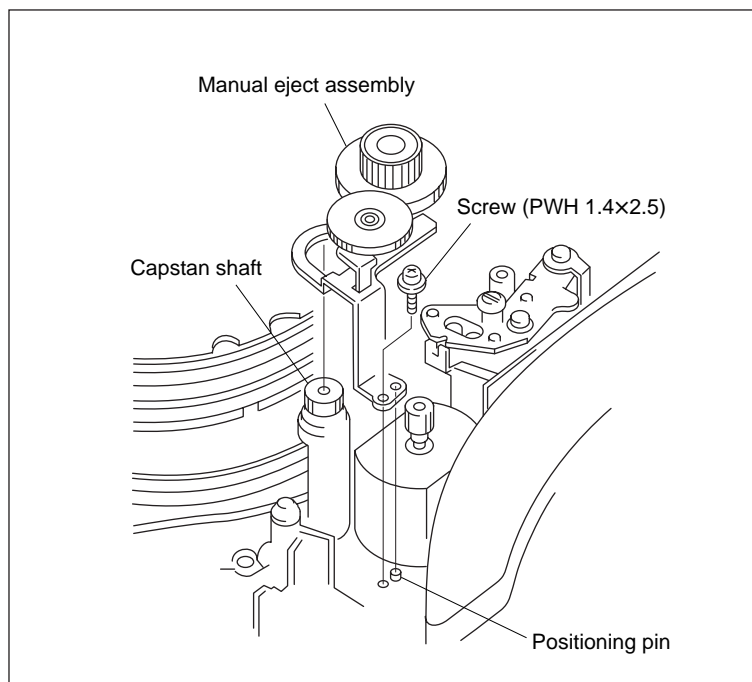
- (1) Turn the power off.
- (2) Remove the front lid and the outside panel.  
(Refer to section 1-6 of Maintenance Manual Part 1.)
- (3) Remove the screw and the manual eject assembly.

#### Installation

- (1) Pass the big hole of the manual eject assembly through the capstan shaft.
- (2) Tighten the screw.
- (3) While pressing down the knob of the manual eject assembly, turn it in the direction or reverse direction of the arrow. When turning it, check that the gears correctly engage and turn.

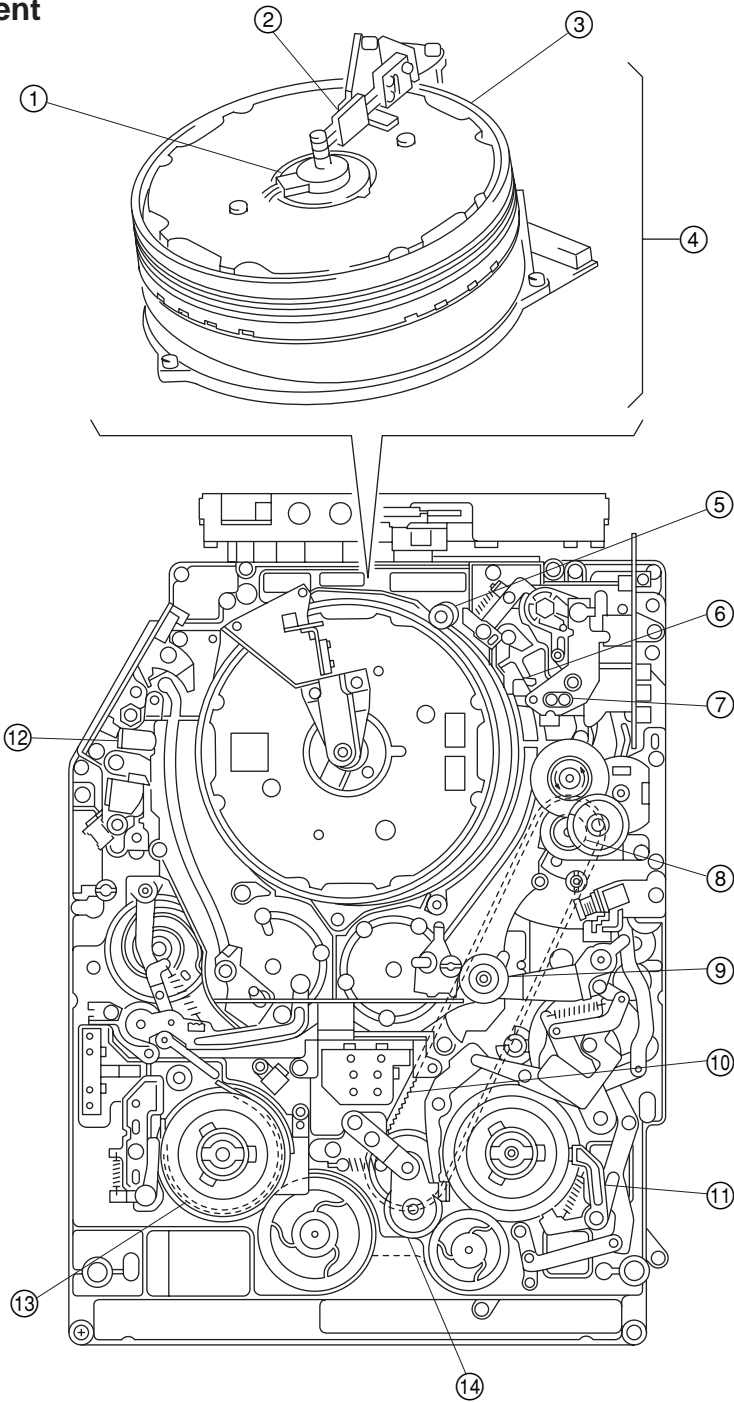
#### Notes

- After the cassette compartment raised up, do not keep on turning the manual eject knob counterclockwise.  
If keep on turning it, the component parts of the unit will break.  
When the marking on the cam is at position shown in the figure, never turn the manual eject knob counterclockwise.
- When closing the front lid after using the manual eject knob, be sure to turn the power on.



4-2. Parts Replacement

1. Index



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| 3   | Upper Drum Assembly                | 4-2-1   | 4-7  |
| 4   | Drum Assembly                      | 4-2-4   | 4-24 |
| 5   | HC Roller Assembly for Video Heads | 4-2-6   | 4-32 |
| 6   | CUE Brush for CUE Head             | 4-2-7   | 4-35 |
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| 13  | Brake Band Assembly   | 4-2-8   | 4-37 |
| 14  | Swing Gear Assembly   | 4-2-11  | 4-47 |



## 2. Notes

### (1) About screwdriver and torque reading

This model uses the screws of the two kinds.

Be sure to use the relevant tools when loosening or tightening.

Be sure to use the torque screwdriver when tightening the screw, and tighten in the relevant torque reading.

Torque screwdriver bit (for M1.4) : J-6325-110-A

Torque screwdriver bit (for M2) : J-6325-380-A

Hexagon bit (across 1.5 mm) : J-6326-120-A

Torque screwdriver (for 3 kg) : J-6325-400-A

Torque reading

For M1.4 (+) screw :  $9 \times 10^{-2} \text{ N}\cdot\text{m}$  {0.9 kgf·cm}

For M2 (+) screw :  $19 \times 10^{-2} \text{ N}\cdot\text{m}$  {1.9 kgf·cm}

For hexagon screw :  $19 \times 10^{-2} \text{ N}\cdot\text{m}$  {1.9 kgf·cm}

#### Note

This model uses the small size screws. When removing or attaching, the screw may fall in the unit. To prevent from the falling, it recommends that the bit of the screwdriver magnetizes.

### (2) About stop washer

Never re-use the pre-used stop washers.

When attaching the part, be sure to use the new stop washer.

Stop washer : 3-726-829-01

#### • Stop washer removal

(a) Remove the stop washer using a pair of small nippers or tweezers.

#### Notes

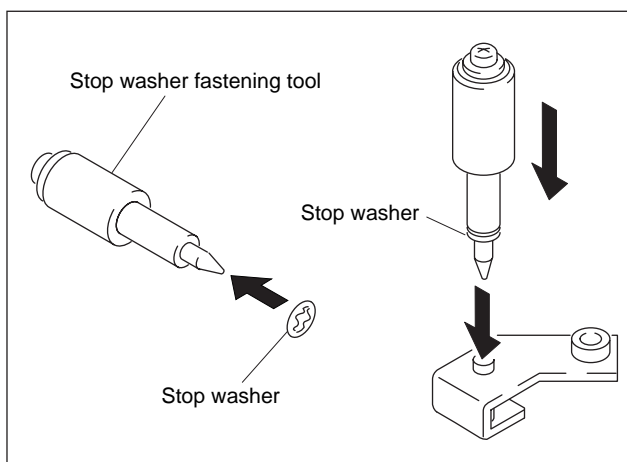
- Take care not to fall in the unit.
- Take care not to touch the tool against the other parts (especially the drum).

#### • Stop washer installation

When attaching, it recommends to use the following tool.

Stop washer fastening tool : J-6323-530-A

- Put the stop washer to the top of the stop washer fastening tool.
- Put the top of the tool on the top of the shaft in an upright position.
- Press down the tool and attach the stop washer to the shaft.



### (3) About oil and grease

Be sure to use the relevant oil and grease.

If the different oil or grease used, major malfunction may cause due to the differences in viscosity and ingredients.

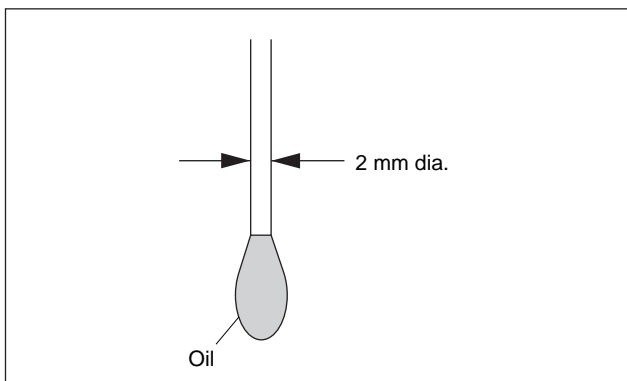
If the oil and grease used which mixed with dust, major malfunction may cause.

Be sure to use the following oil and grease.

Oil : 7-661-018-18

Grease (SGL-701) : 7-662-010-08

- A drop of oil defines as follows; About the amount will adhere to the end of a stick (2 mm in diameter) as shown in the figure.
- Smear grease onto the surface of the part like a thin film.  
If grease smeared apart from the relevant areas, be sure to wipe using a gauze or soft cloth.
- Apart from the relevant areas never use the oil and grease.



## 4-2-1. Upper Drum Assembly Replacement

### Overviews

| Replacement  |
|--|
| Brush Cover Removal                                  |
| Brush Assembly Removal                               |
| Desoldering the Leads of Slip Ring Assembly          |
| Upper Drum Assembly Removal                          |
| Cleaning of Contact Surfaces                         |
| Upper Drum Assembly Installation                     |
| Upper Drum Eccentricity Adjustment Tool Installation |
| Upper Drum Eccentricity Adjustment                   |
| Upper Drum Eccentricity Adjustment Tool Removal      |
| Soldering the Leads of Slip Ring Assembly            |
| Brush Assembly Installation                          |
| Brush Cover Installation                             |
| Cleaning of Video Heads and Tape Running Surfaces    |
| Adjustments after replacement                        |
| Tape Running Adjustment                              |
| Video Racking Adjustment                             |
| CTL Head Height Adjustment                           |
| CTL Head Position Adjustment                         |
| CUE Head Height Adjustment                           |
| CUE/TC Head Position Adjustment                      |
| PG Phase Adjustment                                  |
| Automatic Servo Adjustment                           |
| Video System Adjustment (Equalizer)                  |

## Notes

If rotary heads are worn out or broken, replace the upper drum assembly.  
The head chip can not be replaced.

## Basic information

Apart from the periodic replacement time, the upper drum assembly needs to be replaced in the following case.

- If a correct RF waveform is not obtained after the tracking adjustment

## Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

### Note

The upper drum assembly can replace when the cassette compartment attaches to the unit.

## Tools

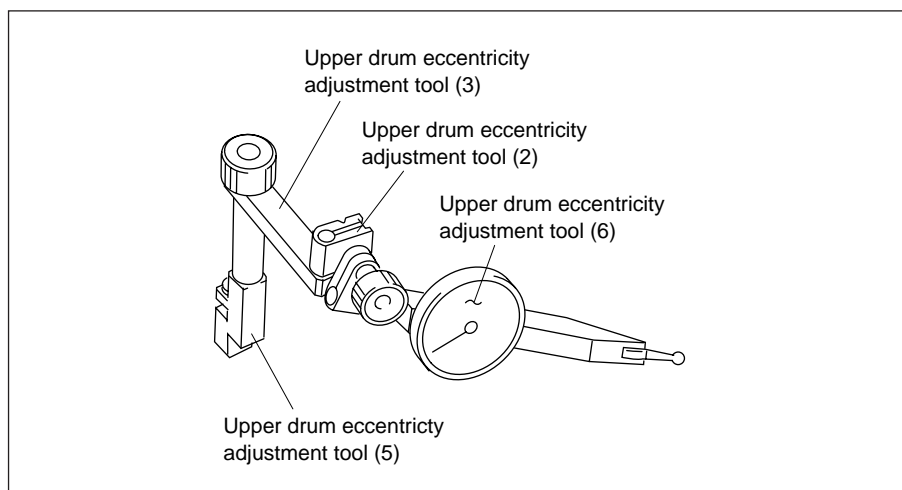
- Torque screwdriver bit (for M2) : J-6325-380-A
- Hexagon bit (across 1.5 mm) : J-6326-120-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Upper drum eccentricity adjustment tool (3) : J-6001-820-A
- Upper drum eccentricity adjustment tool (2) : J-6001-830-A
- Upper drum eccentricity adjustment tool (5) : J-6087-000-A
- Upper drum eccentricity adjustment tool (6) : J-6325-530-A
- L wrench (across 1.5 mm) : 7-700-736-05
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

### Notes

- (1) If the upper drum assembly is attached to the flange, tighten the screws to the following torque reading.
  - First:  $9.8 \times 10^{-2} \text{ N}\cdot\text{m}$  { 1 kgf $\cdot$ cm }
  - Second:  $24.5 \times 10^{-2} \text{ N}\cdot\text{m}$  { 2.5 kgf $\cdot$ cm }

To tighten the screws to the above torque reading, set the torque to  $9.8 \times 10^{-2} \text{ N}\cdot\text{m}$  { 1kgf $\cdot$ cm } after attaching the hexagon bit to the torque screwdriver.

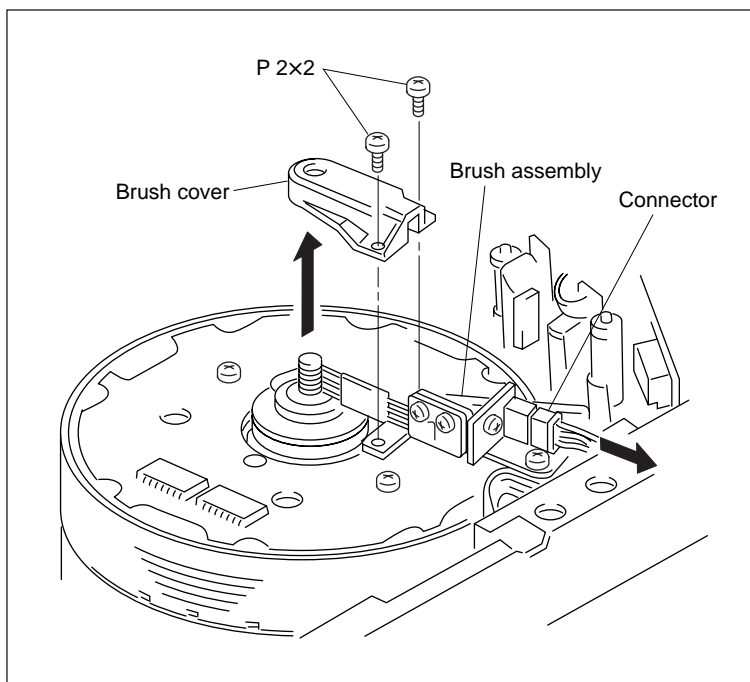
- (2) Assemble the upper drum eccentricity adjustment tool before it is used.



## Removal

### 1. Brush Cover Removal

- (1) Disconnect the connector on the brush assembly board.
- (2) Remove the two screws and the brush cover.

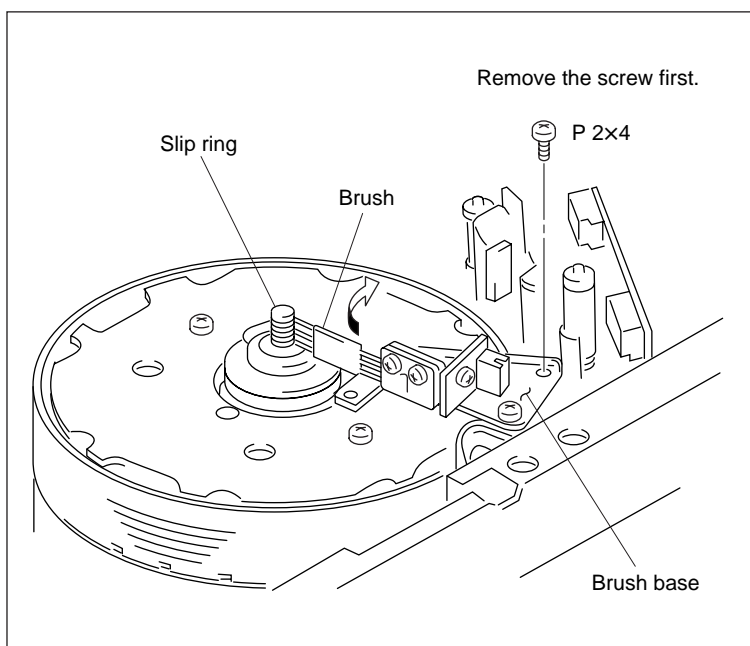


### 2. Brush Assembly Removal

- (1) Remove one of the screws which secures the brush base.
- (2) Loosen the other screw and move the brush base in the direction of the arrow.  
In this way the brush and slip ring will release.
- (3) Remove the screw and the brush assembly.

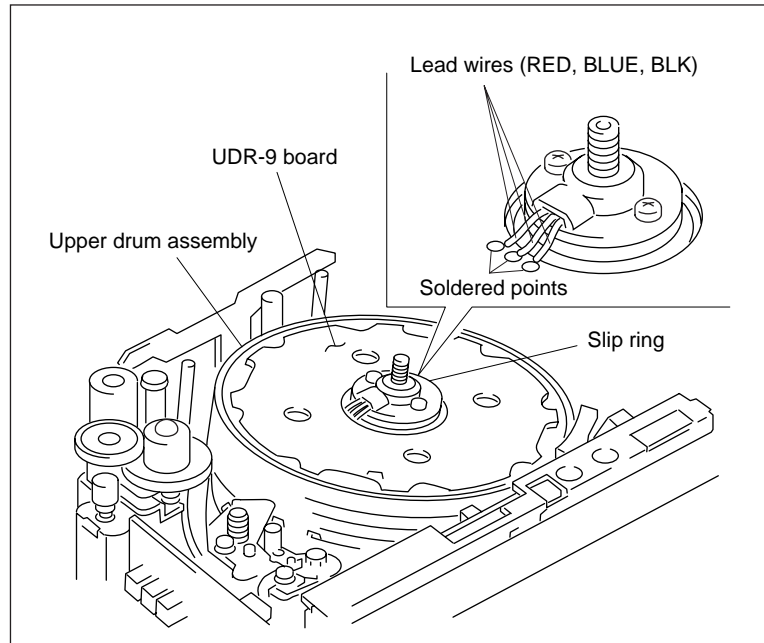
#### Note

Never touch the brush.



### 3. Desoldering the Leads of Slip Ring Assembly

Desolder the three leads of the slip ring assembly from the UDR-9 board on the upper drum assembly.

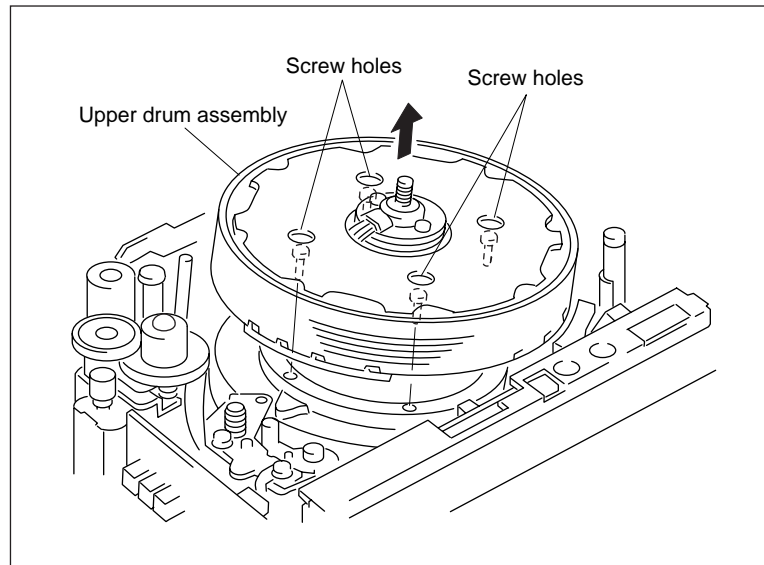


### 4. Upper Drum Assembly Removal

- (1) Put an L wrench in the holes of the upper drum assembly and remove the four screws.
- (2) Lift just above and remove the upper drum assembly.

#### Notes

- After removing, take care not to damage the upper edge of the lower drum.
- Remove the screws from the removed upper drum assembly using a pair of tweezers.



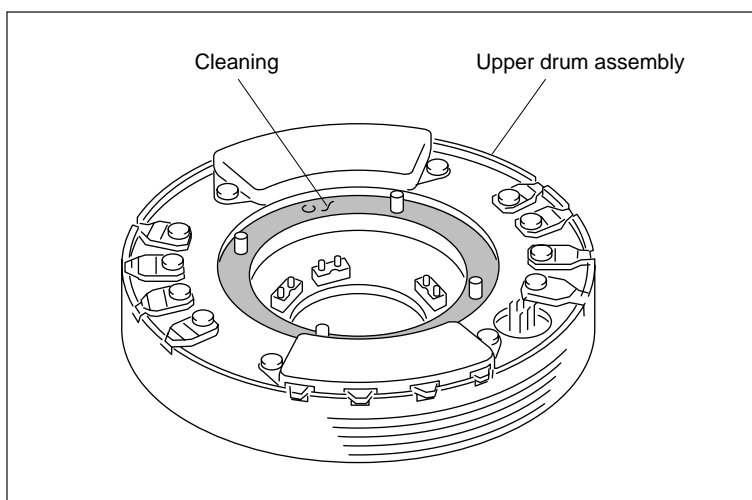
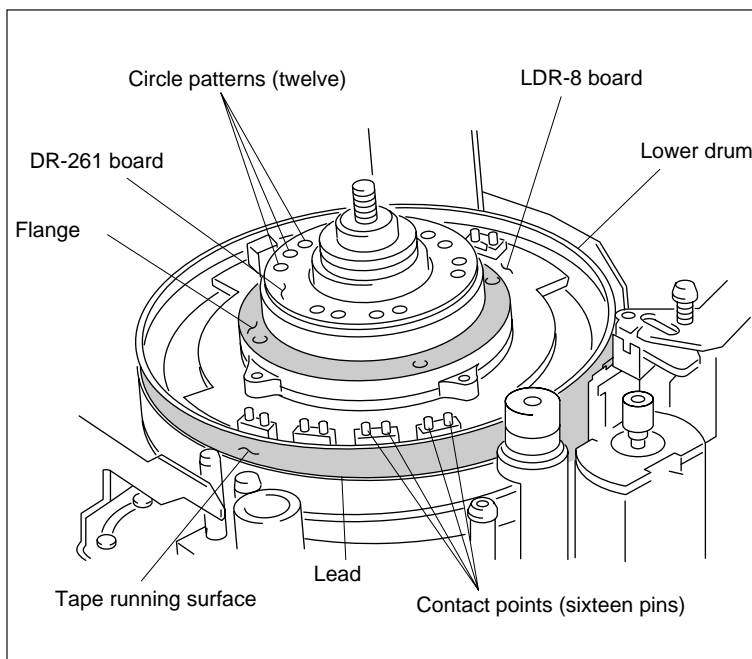
## Installation

### 5. Cleaning of Contact Surfaces

- (1) Clean the following places using a cleaning cloth moistened with cleaning fluid.
  - Flange of the lower drum (Shaded portion)
  - Tape running surface and lead of the lower drum
  - Contact surface of the new upper drum assembly (Shaded portion)
- (2) Wipe the eight contact points (sixteen pins) that mounts onto the LDR-8 board of the flange and twelve circle patterns on the DR-261 board using a dry cleaning cloth.

**Note**

Never clean using a cleaning cloth moistened with cleaning fluid.



## 6. Upper Drum Assembly Installation

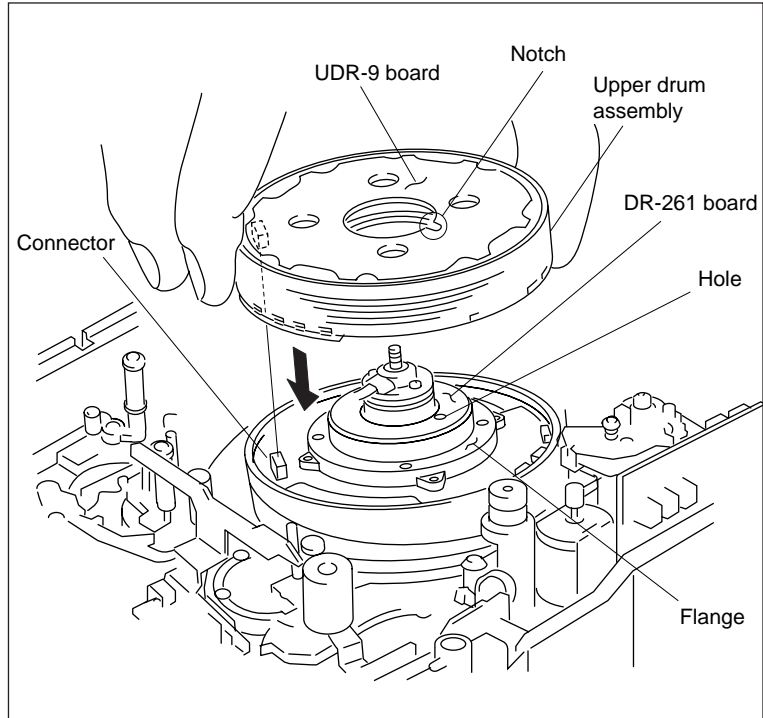
- (1) Hold the areas of the new upper drum assembly where video heads are not installed, by hand. Align the notch of the center hole on the UDR-9 board with the hole of the DR-261 board.

- (2) Move the upper drum assembly in the direction of the flange (Do not tilt.) and connect a 6-pin connector plug to a connector on the LDR-8 board of flange.

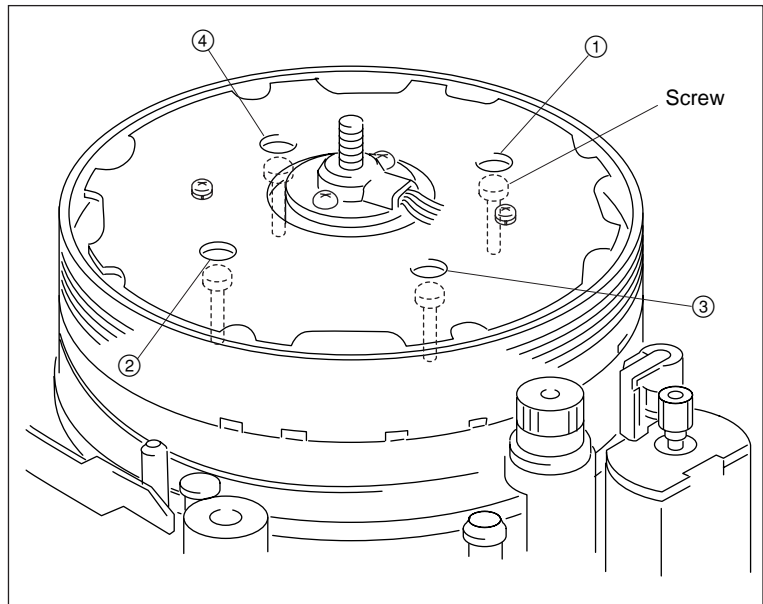
### Note

When attaching, take care not to touch the video heads against the brush support or the peripheral parts.

- (3) Press the upper drum assembly in the direction of the flange until it securely is attached.



- (4) Put the four screws which are removed in step 4 in the four holes on the board of the upper drum assembly using a pair of tweezers.
- (5) Using the L wrench thread the four screws in the sequence shown in the figure. Do not tighten them.



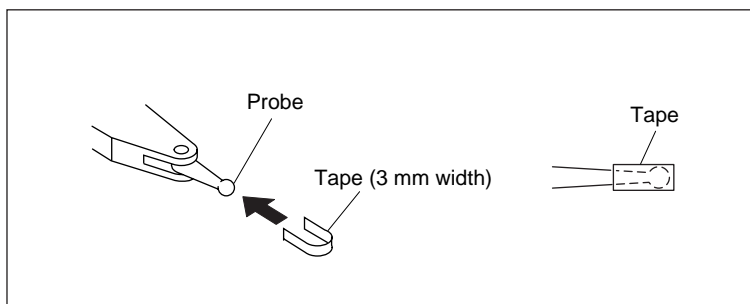


## 7. Upper Drum Eccentricity Adjustment Tool Installation

- (1) Clean the probes of the tool using a cleaning cloth moistened with cleaning fluid.

### Notes

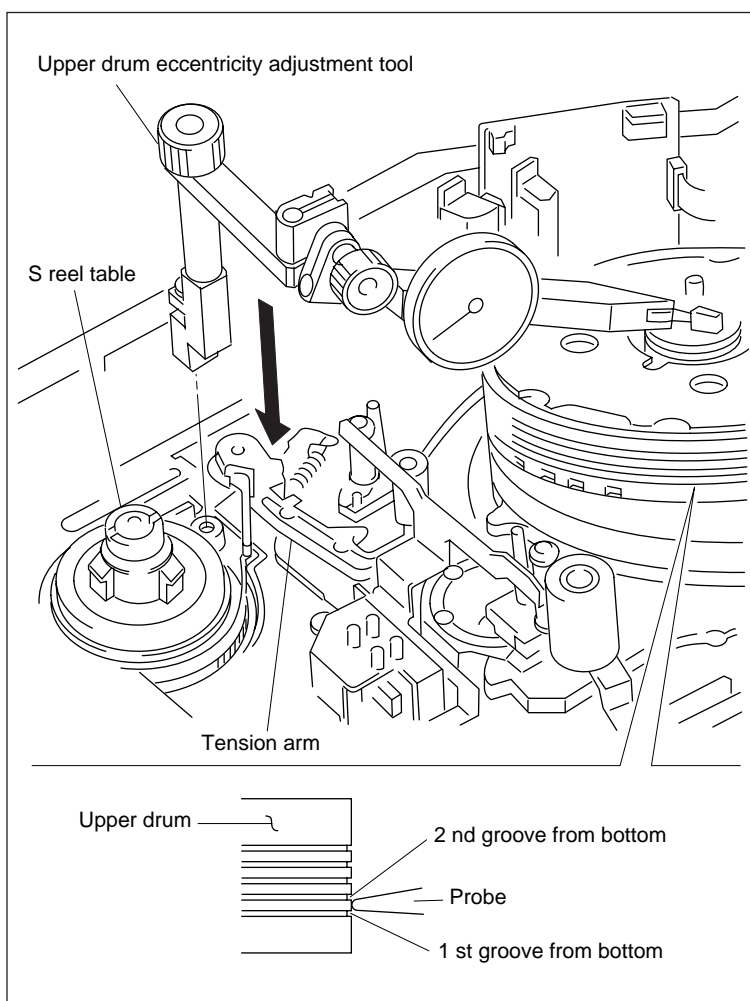
- If the probes were dirty, the upper drum assembly may scratch.
- If the probes were made of metal, it recommends that lubricated protective tape puts on the probes to prevent the scratching.



- (2) Attach the tool as shown in the figure and adjust so that the probe is positioned between the bottom two grooves of the five which locate on the outside of the upper drum assembly.

### Note

Take care not to touch the probes against the video heads



## 8. Upper Drum Eccentricity Adjustment

- (1) Slowly turn the upper drum assembly counterclockwise and for one turn check that the indicated deflection of a gauge meets the following specification.

Specification : Within 3  $\mu\text{m}$

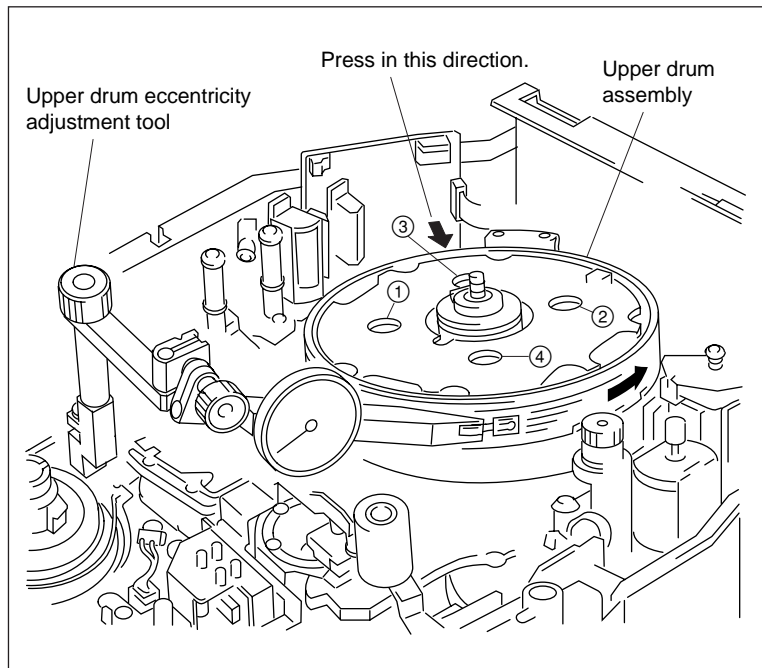
If the specification did not meet, repeat the following three steps and adjust until the specification meets.

- (a) Slowly turn the upper drum assembly counterclockwise and check the maximum and minimum value of the indicated deflections.
- (b) Turn the upper drum assembly until the minimum deflection value indicates.
- (c) From the end opposite of the probe press the upper drum assembly in the direction of the arrow so that the indicated deflection is half way between maximum and minimum value.

### Note

If the indicated deflection did not move when pressing the upper drum assembly by finger, loosen the four screws that secure the upper drum assembly.

If the indicated deflection easily moved when pressing, tighten the screws a little.



- (2) Set the torque screwdriver to  $9.8 \times 10^{-2} \text{ N}\cdot\text{m}$  {1 kgf $\cdot\text{cm}$ }. Put the torque screwdriver in the four holes on the board of the upper drum assembly. Tighten the four screws in the sequence shown in the figure.

### Note

When tightening the screws just after the eccentricity adjustment, be sure to tighten them to  $9.8 \times 10^{-2} \text{ N}\cdot\text{m}$  {1 kgf $\cdot\text{cm}$ }.

- (3) Set the torque screwdriver to  $24.5 \times 10^{-2} \text{ N}\cdot\text{m}$  {2.5 kgf $\cdot\text{cm}$ }.
- (4) Tighten the four screws in the same sequence as in step 2.
- (5) Re-check that the specification met.

## 9. Upper Drum Eccentricity Adjustment Tool Removal

Remove the upper drum eccentricity adjustment

## 10. Soldering the Leads of Slip Ring Assembly

Solder the three leads of the slip ring assembly to the UDR-9 board on the upper drum assembly.

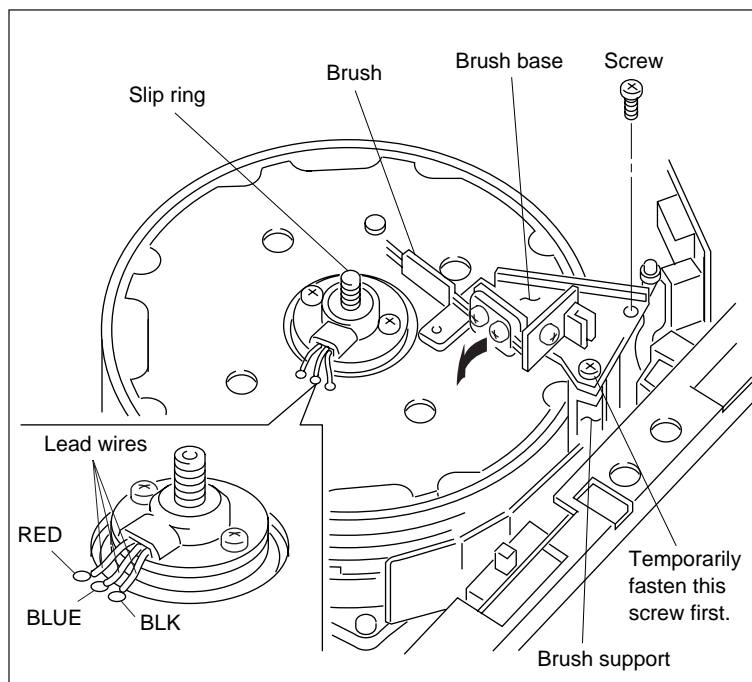
Red lead : RED pattern

Blue lead : BLUE pattern

Black lead : BLK pattern

## 11. Brush Assembly Installation

- (1) Temporarily attach the brush assembly to the brush support using the screw as shown in the figure.
- (2) Move the brush base while pressing down the brush base above the brush support and temporarily attach the brush assembly using the other screw.
- (3) Tighten the screws in steps (1) and (2).

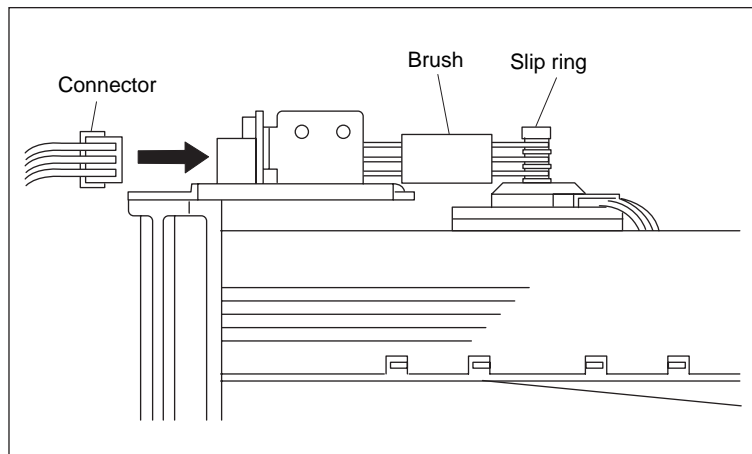


- (4) Check that the brush touches against the slip ring.

### Note

Once steps (1) to (3) are completed, the height of the brush and contact pressure against the slip ring will be automatically adjusted.

- (5) Connect the connector on the brush assembly board.



## 12. Brush Cover Installation

Align the hole of the brush cover with the shaft of the slip ring and tighten the two screws.

## 13. Cleaning of Video Heads and Tape Running Surfaces

Clean the following areas using a cleaning cloth moistened with cleaning fluid.

- Video heads (Refer to section 7-1-2 of Maintenance Manual Part 1.)
- Tape running surface of the upper drum (Refer to section 7-1-2 of Maintenance Manual Part 1.)
- Tape running surface and lead of the lower drum (Refer to section 7-1-3 of Maintenance Manual Part 1.)

### Note

After cleaning, be sure to wipe the relevant areas using a dry cleaning cloth.

---

## **Adjustments After Replacement**

### **14. Tape Running Adjustment**

(Refer to section 5-1.)

### **15. Video Tracking Adjustment**

(Refer to section 5-2.)

### **16. CTL Head Height Adjustment**

(Refer to section 5-3.)

### **17. CTL Head Position Adjustment**

(Refer to section 5-4.)

### **18. CUE Head Position Adjustment**

(Refer to section 5-5.)

### **19. CUE/TC Head Position Adjustment**

(Refer to section 5-8.)

### **20. PG Phase Adjustment**

(Refer to section 6-3-1.)

### **21. Automatic Servo Adjustment**

(Refer to section 6-3-2.)

### **22. Video System Adjustment (Equalizer)**

(Refer to section 6-5.)

## 4-2-2. Brush Assembly Replacement for Slip Ring

### Overviews

| Replacement                 |
|-----------------------------|
| Brush Cover Removal         |
| Brush Assembly Removal      |
| Brush Assembly Installation |
| Brush Cover Installation    |

### Notes

If the brush worn out, replace the brush assembly.  
Once the brush assembly is attached referring to the following procedures, the relative height and contact pressure against the slip ring will be automatically adjusted.  
Never clean surface of the brush using a cleaning cloth moistened with cleaning fluid.

### Preparations

1. Turn the power off.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

Note

The brush assembly can be replaced when the cassette compartment is attached to the unit.

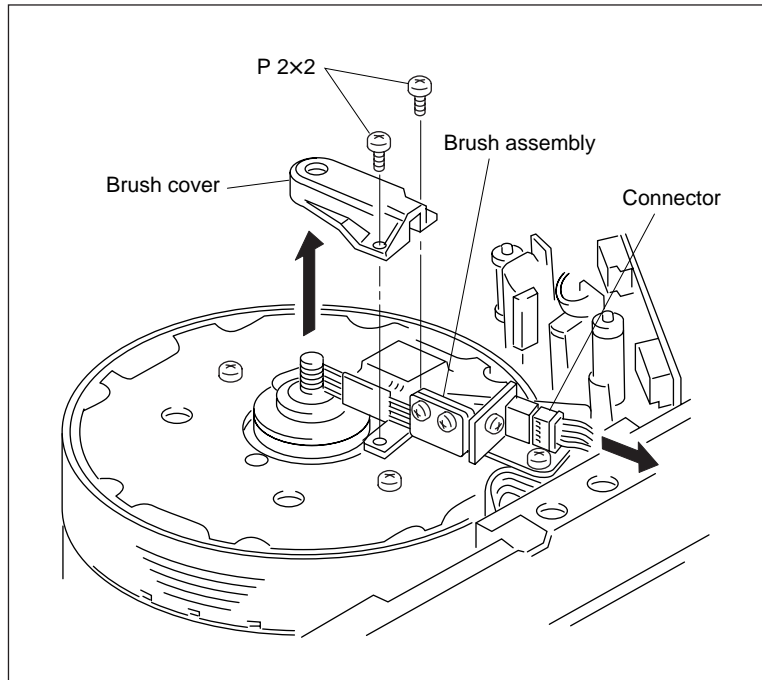
### Tools

- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

## Removal

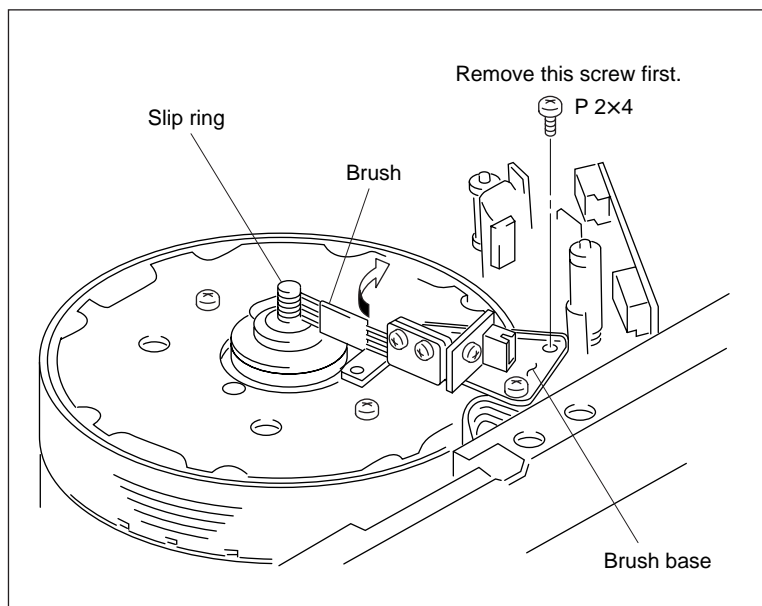
### 1. Brush Cover Removal

- (1) Disconnect the connector on the brush assembly board.
- (2) Remove the two screws and the brush cover.



### 2. Brush Assembly Removal

- (1) Remove one of the screws which secures the brush base as shown in the figure.
- (2) Loosen the other screw and move the brush base in the direction of the arrow. In this way the brush and slip ring will release.
- (3) Remove the screw and the brush assembly.



## Installation

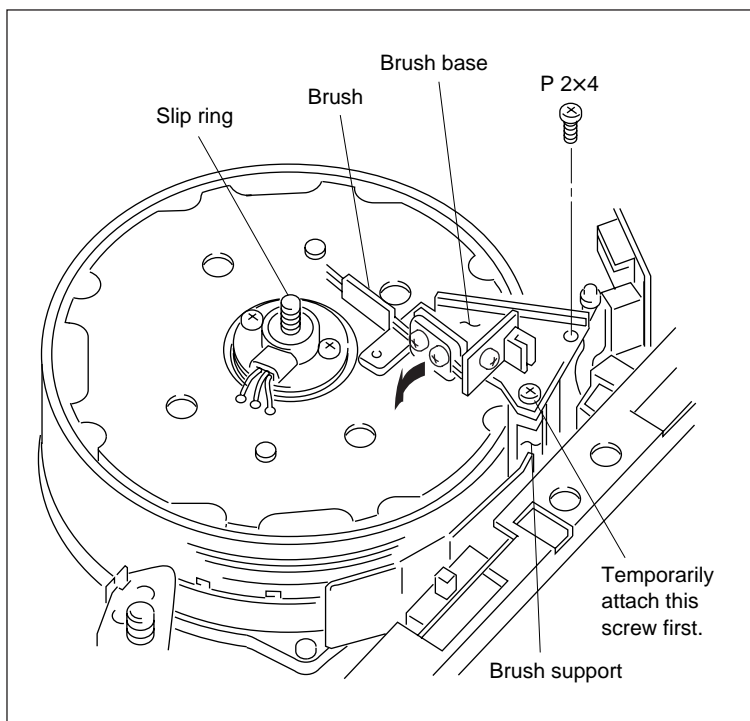
### 3. Brush Assembly Installation

- (1) Temporarily attach the brush assembly to the brush support using the screw shown in the figure.

**Note**

Never touch the brush.

- (2) Move the brush base while pressing down the brush base above the brush support and temporarily attach the brush assembly using the other screw.
- (3) Tighten the screws which are attached in steps (1) and (2).

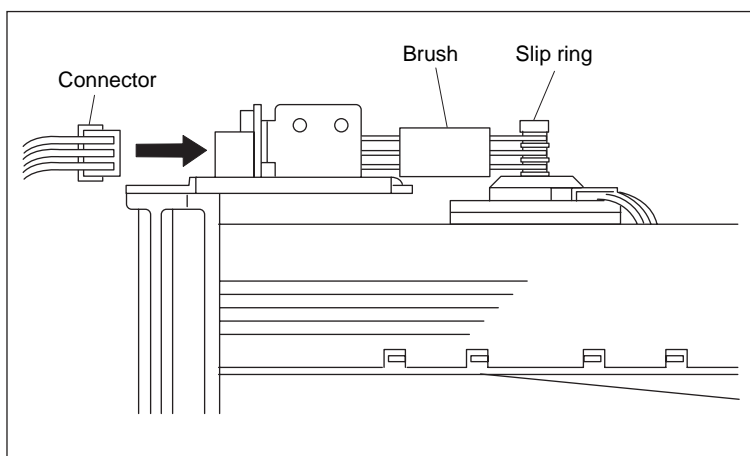


- (4) Check that the brush touches against the slip ring.

**Note**

Once steps (1) to (3) are completed, the height of the brush and contact pressure against the slip ring will be automatically adjust.

- (5) Connect the connector on the brush assembly board.



### 4. Brush Cover Installation

Align the hole of the brush cover with the shaft of the slip ring and tighten the two screws.

### 4-2-3. Slip Ring Assembly Replacement

#### Overviews

| Replacement                     |
|---------------------------------|
| Brush Cover Removal             |
| Brush Assembly Removal          |
| Slip Ring Assembly Removal      |
| Slip Ring Assembly Installation |
| Brush Assembly Installation     |
| Brush Cover Installation        |

#### Notes

If the slip ring worn out, replace the slip ring assembly.  
Once the slip ring assembly is replaced, the adjustment is not needed.  
Never clean surface of the slip ring assembly using a cleaning cloth moistened with cleaning fluid.

#### Preparations

1. Turn the power off.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

Note

The slip ring assembly can be replaced when the cassette compartment is attached to the unit.

#### Tools

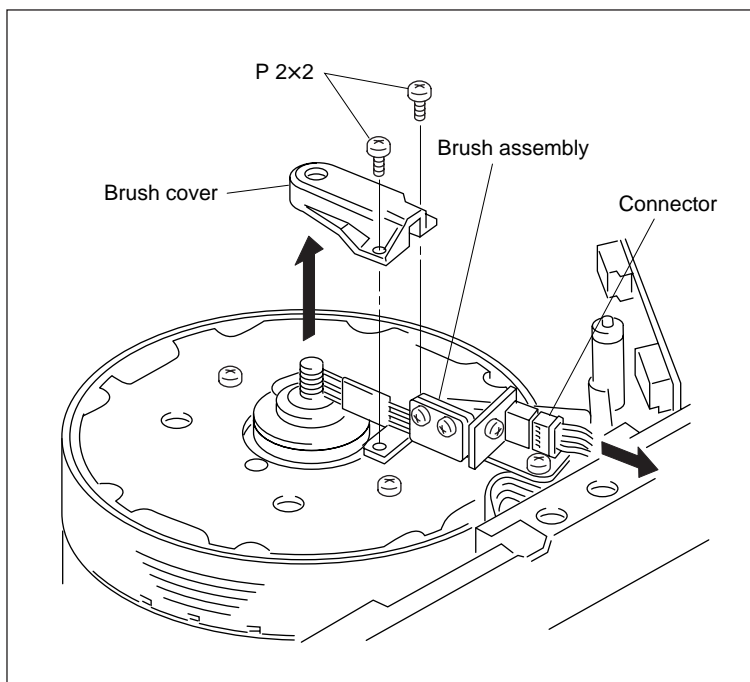
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A



## Removal

### 1. Brush Cover Removal

- (1) Disconnect the connector on the brush assembly board
- (2) Remove the two screws and the brush cover.

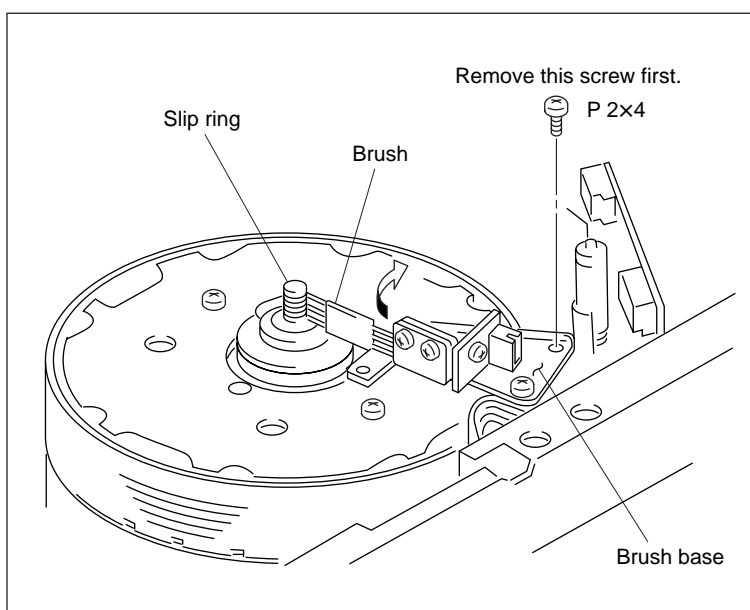


### 2. Brush Assembly Removal

- (1) Remove one of the screws which secures the brush base as shown in the figure.
- (2) Loosen the other screw and move the brush base in the direction of the arrow.  
In this way the brush and slip ring will release.
- (3) Remove the screw and the brush assembly.

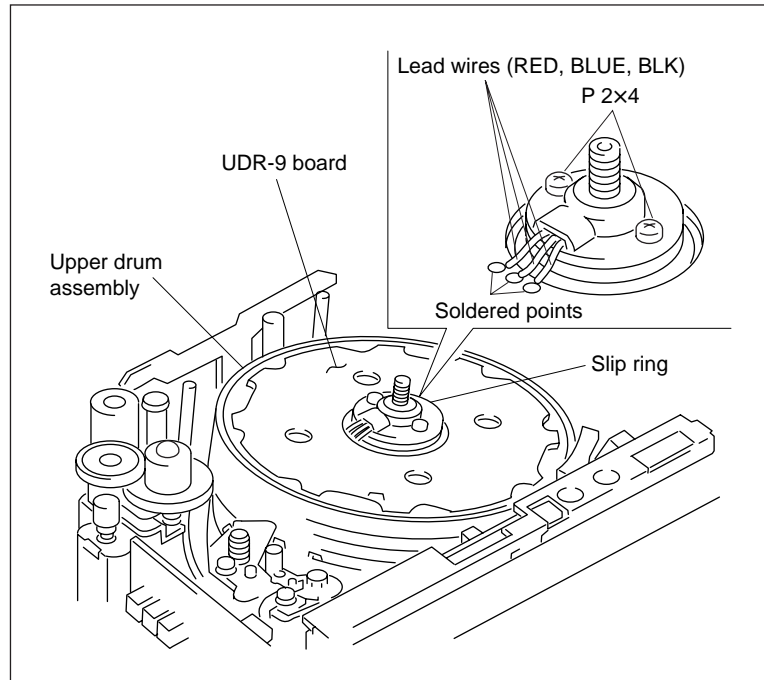
#### Note

Never touch the brush.



### 3. Slip Ring Assembly Removal

- (1) Desolder the three leads of the slip ring assembly from the UDR-9 board on the upper drum assembly.
- (2) Remove the two screws and the slip ring assembly.



## Installation

### 4. Slip Ring Assembly Installation

- (1) Attach the slip ring assembly to the drum shaft so that the three leads of the slip ring assembly are positioned to the printed silk (RED, BLUE and BLK) on the UDR-9 board of the upper drum assembly.

#### Note

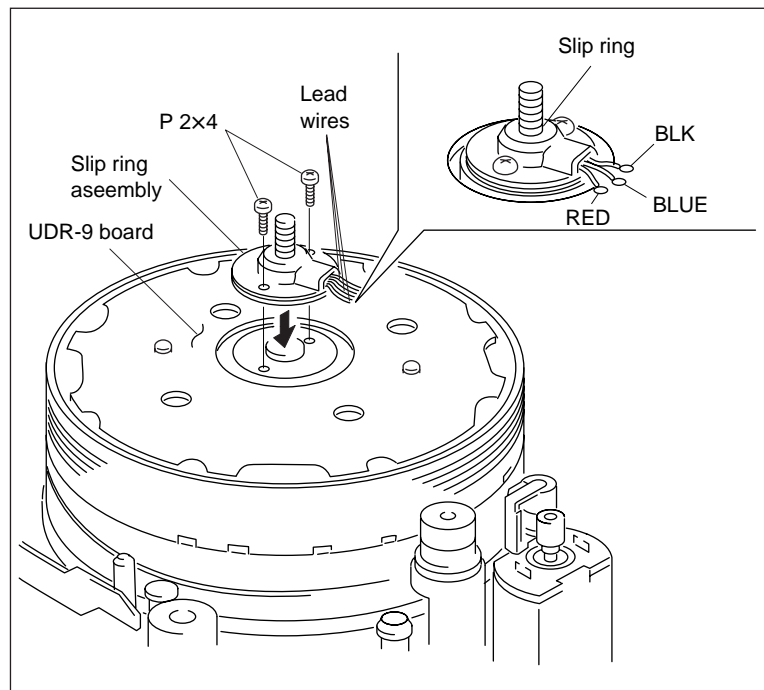
Hold the black portion of the slip ring assembly. Never touch the slip ring.

- (2) Attach the slip ring assembly using the two screws.
- (3) Solder the three leads of the slip ring assembly to the UDR-9 board on the upper drum assembly.

Red lead : RED pattern

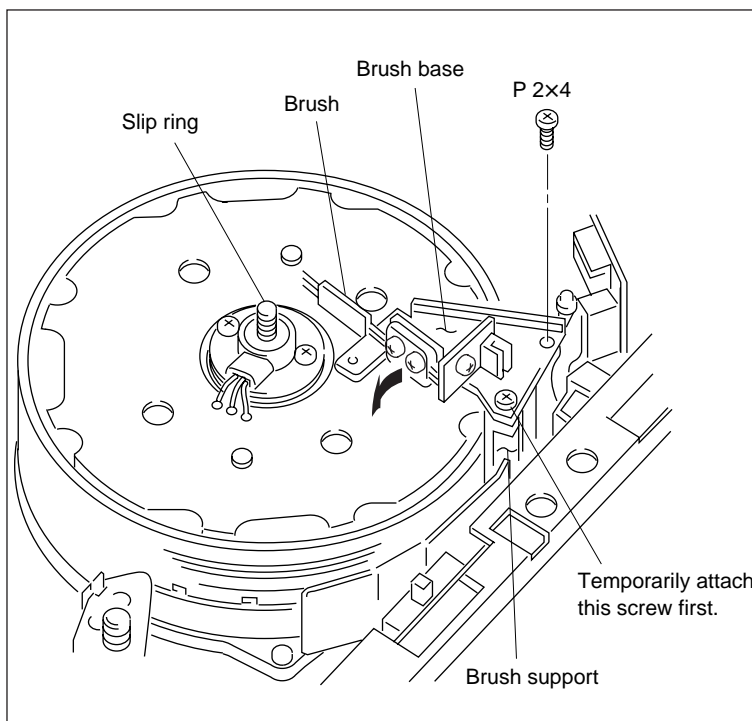
Blue lead : BLUE pattern

Black lead : BLK pattern



## 5. Brush Assembly Installation

- (1) Temporarily attach the brush assembly to the brush support using the screw shown in the figure.
- (2) Move the brush base in the direction of the arrow while pressing down the brush base above the brush support and temporarily attach the brush assembly using the other screw.
- (3) Tighten the screws which are attached in steps (1) and (2).

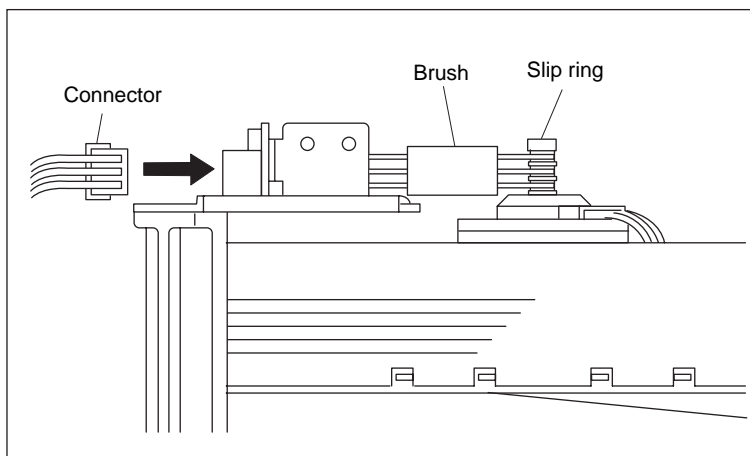


- (4) Check that the brush touches against the slip ring.

### Note

Once steps (1) to (3) are completed, the height of the brush and contact pressure against the slip ring will be automatically adjust.

- (5) Connect the connector on the brush assembly board.



## 6. Brush Cover Installation

Align the hole of the brush cover with the shaft of the slip ring and tighten the two screws.

## 4-2-4. Drum Assembly Replacement

### Overviews

| Replacement                                      |
|--|
| Video Head Cleaner Removal                       |
| Disconnection of the Brush Assembly Connector    |
| Drum Assembly Removal                            |
| Cleaning of Contact Surfaces                     |
| Drum Assembly Installation                       |
| Connection of the Brush Assembly Connector       |
| Video Head Cleaner Installation                  |
| Cleaning of Video Heads and Tape Running Surface |
|  |
| Adjustments after replacement                    |
| Tape Running Adjustment                          |
| Video Tracking Adjustment                        |
| CTL Head Height Adjustment                       |
| CTL Head Position Adjustment                     |
| CUE Head Height Adjustment                       |
| CUE/TC Head Position Adjustment                  |
| PG Phase Adjustment                              |
| Automatic Servo Adjustment                       |
| Video System Adjustment (Equalizer)              |

### Notes

When replacing the drum assembly, take care not to damage the CTL head, CUE/TC head and the peripheral tape guides.

Take care not to break the video heads of the drum assembly.

### Basic information

Apart from the periodic replacement, the drum assembly needs to be replaced in the following cases.

- If the drum assembly could not be used because the tape running surface of the upper or lower drum scratched.
- If a correct RF waveform is not obtained after the tracking adjustment due to wear-out on the upper or lower drum.
- If the specification of the VTR such as jitter or noise does not meet due to the short life of the bearing.

## Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

### Note

The drum assembly can be replaced when the cassette compartment is attached to the unit.

## Tools

- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

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## Removal

### 1. Video Head Cleaner Removal

- (1) Check that the unit is in the unthreading end mode.
- (2) Turn the manual eject gear clockwise. Release the HC roller of the video head cleaner from the drum.
- (3) Loosen the screw while holding the VH cleaner using a pair of tweezers and remove it from the unit.  
(Refer to section 4-2-6.)

### Note

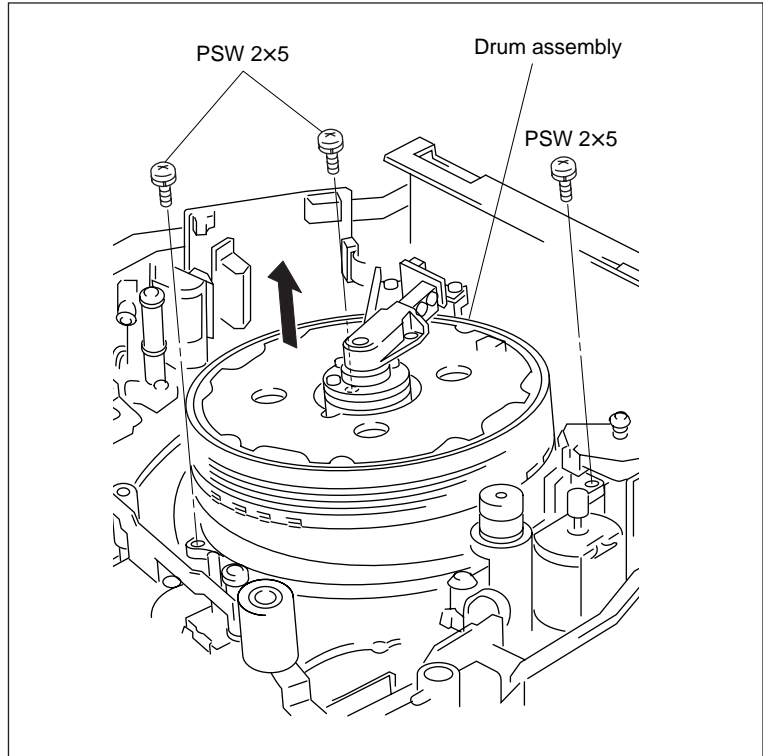
The screw can not be removed due to the drop-safe.

### 2. Disconnection of the Brush Assembly Connector

Disconnect the connector on the brush assembly board.

### 3. Drum Assembly Removal

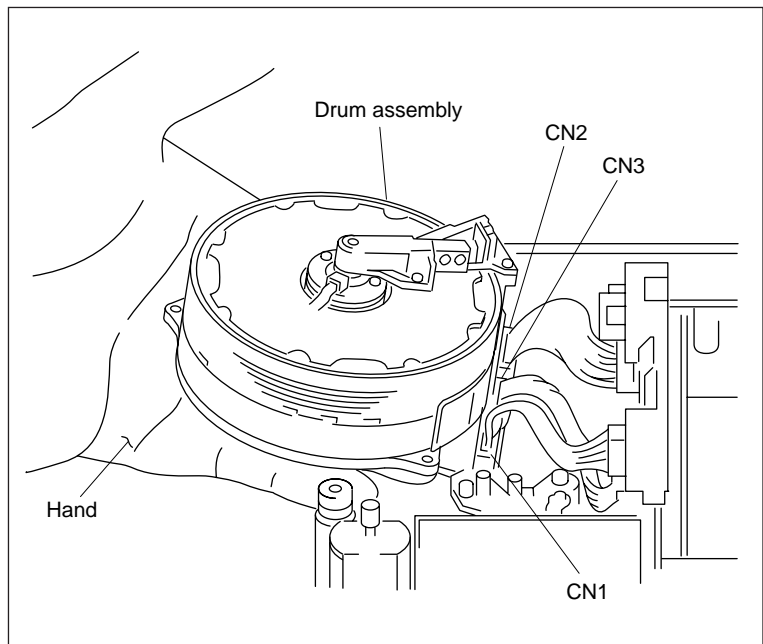
- (1) Remove the three screws which secure the drum assembly.



- (2) Lift just above the drum assembly and disconnect the three connectors (CN1, CN2 and CN3) on the lower board of the drum.
- In this way the drum assembly will remove.

**Note**

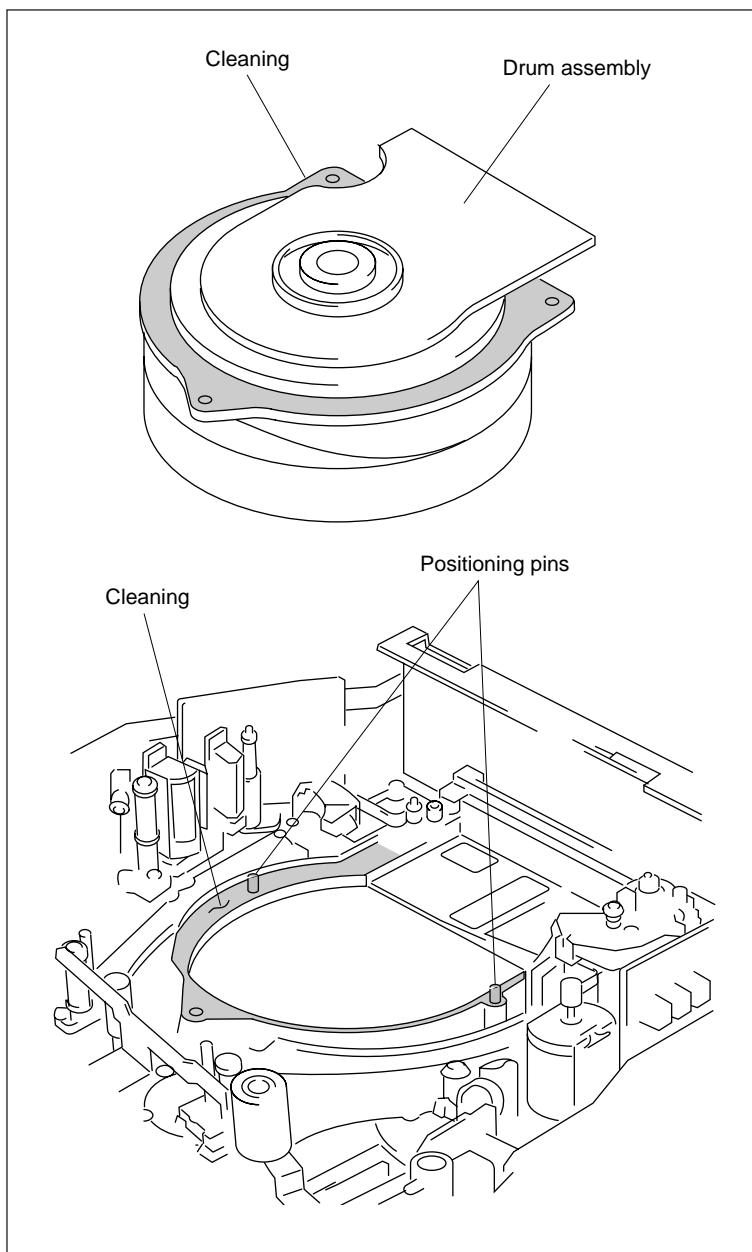
When removing, take care not to damage the CTL head, CUE/TC head and the peripheral tape guides.



## Installation

### 4. Cleaning of Contact Surfaces

Clean the contact surfaces of the new drum assembly and chassis using a cleaning cloth moistened with cleaning fluid.



## 5. Drum Assembly Installation

- (1) Hold the new drum assembly and connect the three connectors (CN1, CN2 and CN3) which are disconnected in step 3.

### Notes

- Be sure to hold the areas where video heads are not installed.
  - Take care not to touch the drum assembly against the CTL head, CUE/TC head and the peripheral tape guides.
- (2) Put the two positioning pins of the chassis to the holes of the drum assembly.
  - (3) Move the drum assembly a little and check that the drum assembly is inserted to in the positioning pins.
  - (4) Tighten the three screws.

## 6. Connection of the Brush Assembly Connector

Connect the connector to the brush assembly board.

## 7. Video Head Cleaner Installation

Put the video head cleaner onto the surface of the unit using a pair of tweezers and tighten the screw.

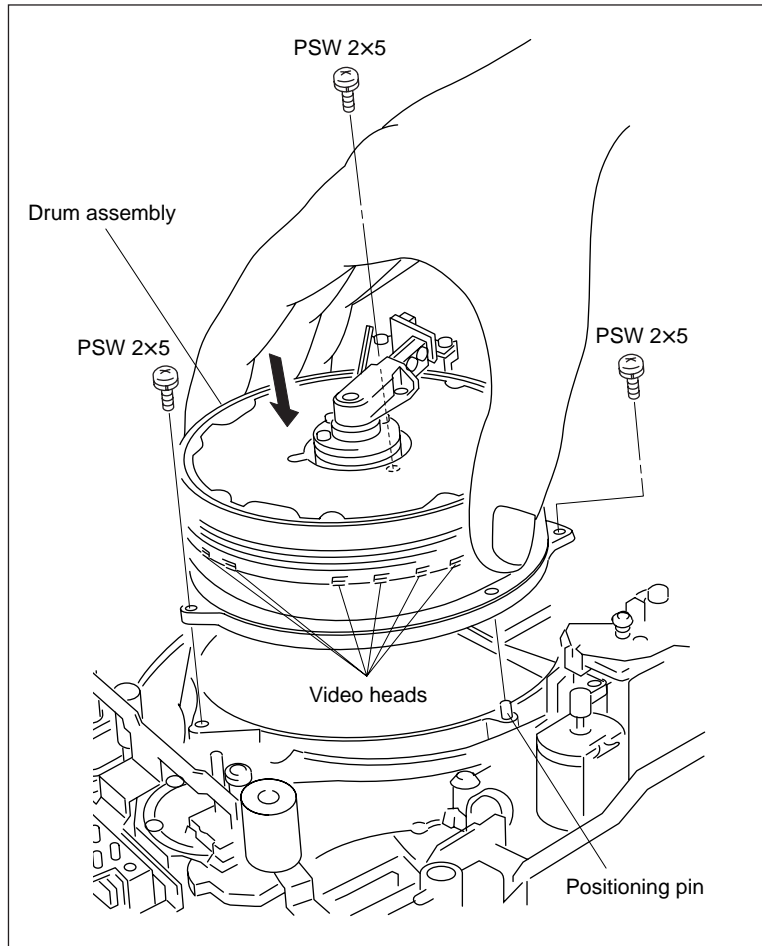
## 8. Cleaning of Video Heads and Tape Running Surface

Clean the following areas using a cleaning cloth moistened with cleaning fluid.

- Video heads (Refer to section 7-1-2 of Maintenance Manual Part 1.)
- Tape running surface of the upper drum (Refer to section 7-1-2 of Maintenance Manual Part 1.)
- Tape running surface and lead of the lower drum (Refer to section 7-1-3 of Maintenance Manual Part 1.)

### Note

After cleaning, be sure to wipe the relevant areas using a dry cleaning cloth.





---

## Adjustments After Replacement

### 9. Tape Running Adjustment

(Refer to section 5-1.)

### 10. Video Tracking Adjustment

(Refer to section 5-2.)

### 11. CTL Head Height Adjustment

(Refer to section 5-3.)

### 12. CTL Head Position Adjustment

(Refer to section 5-4.)

### 13. CUE Head Height Adjustment

(Refer to section 5-5.)

### 14. CUE/TC Head Position Adjustment

(Refer to section 5-8.)

### 15. Automatic Servo Adjustment

(Refer to section 6-3-1.)

### 16. PG Phase Adjustment

(Refer to section 6-3-2.)

### 17. Video System Adjustment

(Refer to section 6-5.)

4-2-5. Pinch Roller Replacement

Overviews

| Replacement                   |
|-------------------------------|
| Pinch Roller Removal          |
| Install Shaft Cleaning        |
| Pinch Roller Installation     |
| Pinch Roller Cleaning         |
|                               |
| Adjustments after replacement |
| Tape Running Adjustment       |
| CUE Head height Adjustment    |

Note

If pinch roller is wornout, replace the pinch roller.

Preparations

- 1. Check that the unit is in the unthreading end mode.
- 2. Turn the power off.
- 3. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

Note

The pinch roller can be replaced when the cassette compartment is attached to the unit.

Tools

- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

## Removal

### 1. Pinch Roller Removal

- (1) Loosen the center screw of the pinch roller.  
Lift just above and remove the pinch roller.
- (2) Remove the screw from the pinch roller.

## Installation

### 2. Install Shaft Cleaning

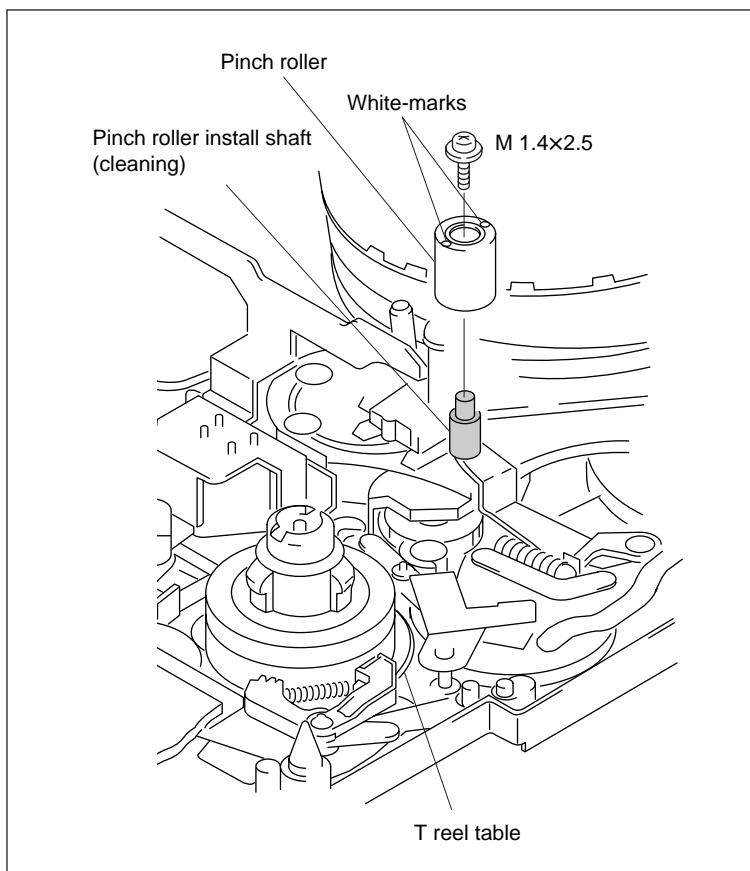
Clean a pinch roller install shaft using a cleaning cloth moistened with cleaning fluid.

### 3. Pinch Roller Installation

Attach the pinch roller to the pinch roller install shaft after the white-marked side is above. Tighten the screw removed in step 1.

### 4. Pinch Roller Cleaning

Clean the surface of the pinch roller using a cleaning cloth moistened with cleaning fluid.



## Adjustments After Replacement

### 5. Tape Running Adjustment

(Refer to section 5-1.)

### 6. CUE Head Height Adjustment

(Refer to section 5-5.)

4-2-6. HC Roller Assembly Replacement for Video Heads

Overviews

| Replacement                      |
|----------------------------------|
| Mode Selection                   |
| VH Cleaner Assembly Removal      |
| HC Roller Replacement            |
| VH Cleaner Assembly Installation |
| Operation Check                  |

Note

The adjustment after replacing is not needed.

Preparations

- 1. Turn the power off.
- 2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

Note

The CR spacer has been used together with the HC roller assembly when attaching the HC roller assembly. When replacing the HC roller assembly, prepare a new CR spacer (3-182-765-02) and use it when attaching the HC roller assembly.

Tools

- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

## Removal

### 1. Mode Selection

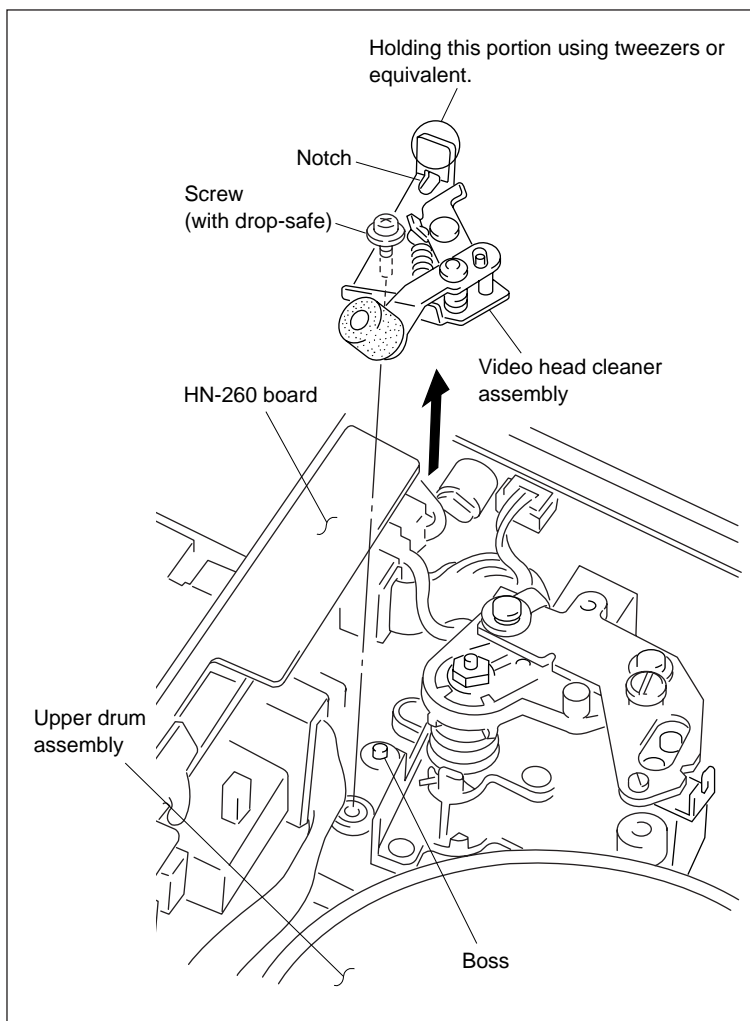
- (1) Check that the unit is the unthreading end mode.
- (2) Turn the manual eject gear clockwise. Release the HC roller from the drum.

### 2. VH Cleaner Assembly Removal

- (1) Turn the upper drum assembly by finger so that the video heads are not situated near the VH cleaner assembly.
- (2) Loosen the screw while holding the VH cleaner using a pair of tweezers as shown in the figure and remove the VH cleaner assembly.

#### Notes

- When removing, take care not to touch the tweezers, screwdriver and VH cleaner assembly against the upper drum or drum assembly.
- The screw can not be removed due to the drop-safe.



## Installation

### 3. HC Roller Replacement

- (1) Remove the CR spacer and the HC roller assembly.
- (2) Put the new HC roller assembly in the shaft and attach using the new CR spacer.

#### Note

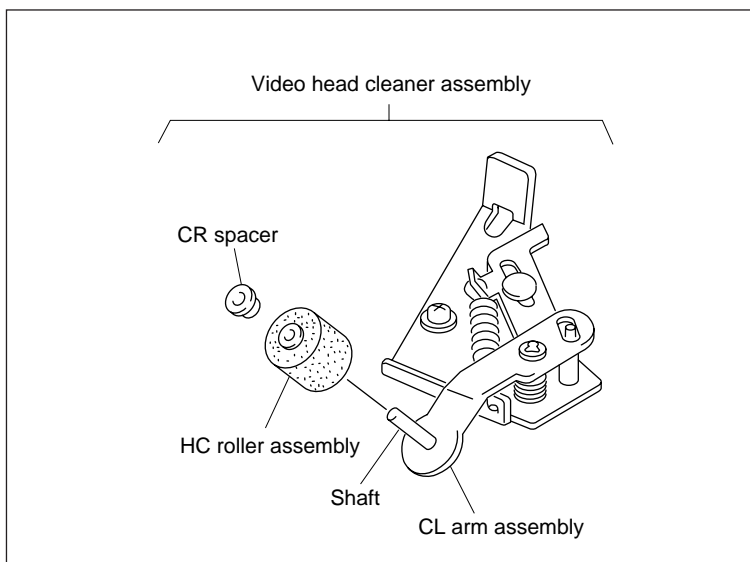
The HC roller assembly can be installed in either side due to no right-side up.

### 4. VH Cleaner Assembly Installation

Put the boss of the chassis in the notch of the VH cleaner assembly and tighten the screw.

### 5. Operation Ceck

When turning the manual eject gear clockwise or counterclockwise, check that the HC roller assembly releases from the drum and touches against the drum.



## 4-2-7. CUE Brush Replacement for CUE Head

### Overviews

| Replacement                        |
|------------------------------------|
| Mode Selection                     |
| Manual Eject Assembly Removal      |
| CUE Brush Replacement              |
| Manual Eject Assembly Installation |
| Operation Check                    |

### Note

The adjustment after replacing is not needed.

### Preparations

1. Turn the power off.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

### Note

The stop washer has been used together with the CUE brush when attaching the CUE brush. When replacing the CUE brush, prepare a new stop washer (3-321-393-11) and use it when attaching the CUE brush.

### Removal

#### 1. Mode Selection

Check that the unit is in the unthreading end mode.

#### 2. Manual Eject Assembly Removal

Remove the manual eject assembly. (Refer to section 4-1-3.)

## Installation

### 3. CUE Brush Replacement

- (1) Remove the stop washer at the top of the CUE arm using a pair of tweezers and the CUE brush.
- (2) Attach the CUE brush and the stop washer.

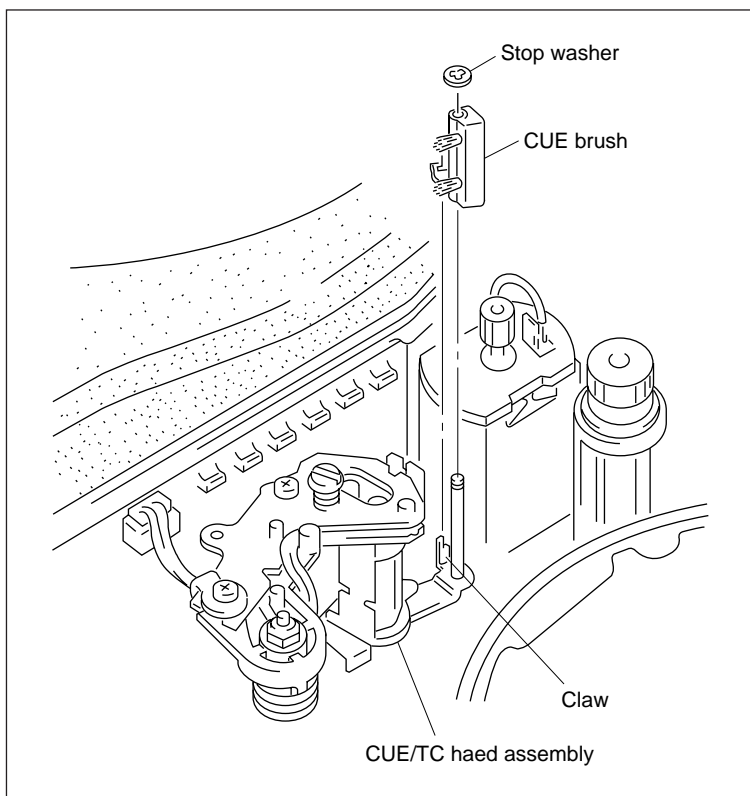
### 4. Manual Eject Assembly Installation

Install the manual eject assembly.

(Refer to section 4-1-3.)

### 5. Operation Check

While pressing down the manual eject gear, turn it in the direction or reverse direction of the arrow. When turning it, check that the CUE brush moves and touches onto the surface of the CUE head.





## 4-2-8. Brake Band Assembly Replacement

### Overviews

| Replacement                                       |
|---|
| Band Holder Removal                               |
| Brake Band Assembly Removal                       |
| S Reel Table Cleaning                             |
| Brake Band Assembly Installation                  |
| Band Holder Installation                          |
| Adjustments after replacement                     |
| Check of the Tension Regulator Operating Position |
| FWD Back Tension Adjustment                       |
| Tape Running Adjustment                           |

### Note

If the felt surface of S brake band assembly became hard or wornout, replace the brake band assembly.

### Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and the outside panel. (Refer to section 1-5 of Maintenance Manual Part 1.)
4. Remove the cassette compartment. (Refer to section 1-8 of Maintenance Manual Part 1.)

### Note

The stop washer has been used together with the brake band assembly when attaching the brake band assembly. When replacing the brake band assembly, prepare a new stop washer (3-726-829-01 or 3-559-408-11).

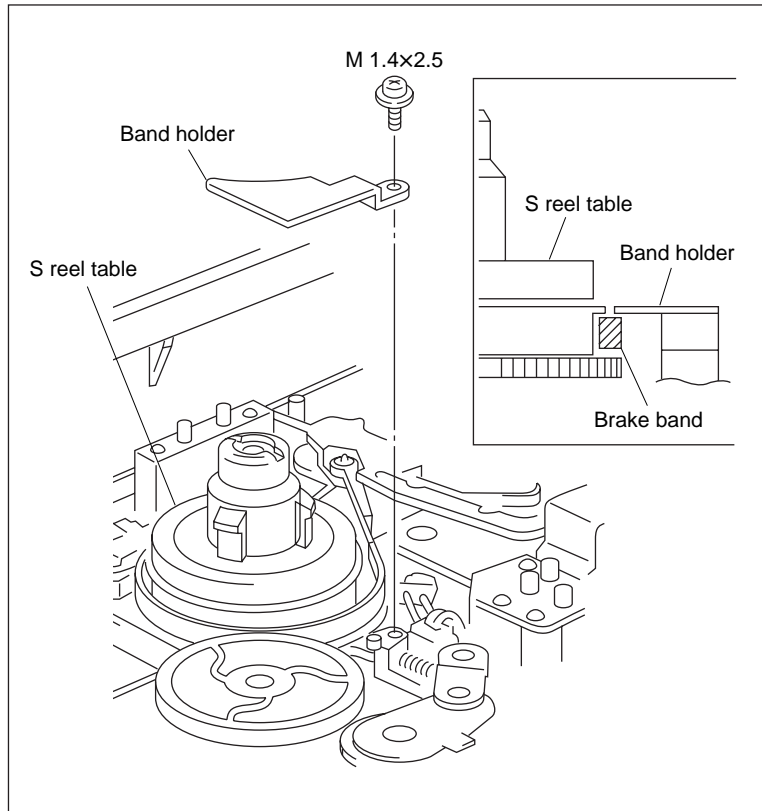
### Tools

- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Stop washer fastening tool : J-6323-530-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

## Removal

### 1. Band Holder Removal

Using the torque screwdriver bit (for M1.4) remove the screw and the band holder.



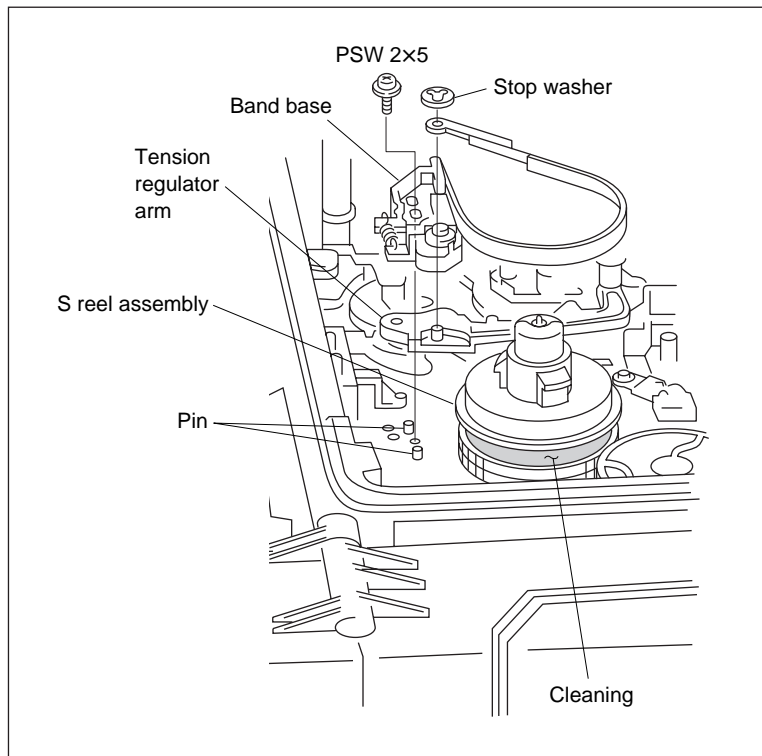
### 2. Brake Band Assembly Removal

- (1) Remove the stop washer on the tension regulator arm.

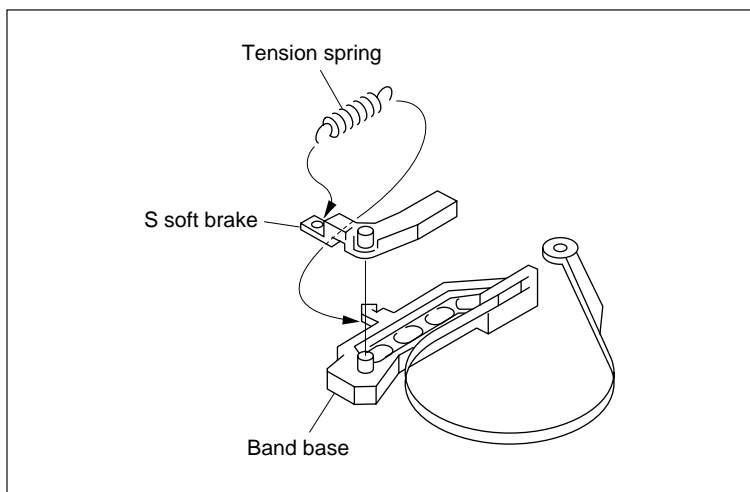
#### Note

When removing, do not press the excessive force to the tension regulator arm.

- (2) Remove the screw and, base holder bracket and the band base.



- (3) Remove the S soft bracket and the tension spring from the band base.



## Installation

### 3. S Reel Table Cleaning

Clean the contact surface with the brake band of the S reel table using a cleaning cloth moistened with cleaning fluid.

### 4. Brake Band Assembly Installation

- (1) Attach the S soft bracket and the tension spring to the band base of the new brake band assembly.
- (2) Put the two pins on the chassis into the two holes of the band base of the new brake band assembly and temporarily attach together with the base holder using the torque screwdriver bit (for M2).
- (3) Put the other hook of the brake band assembly in the shaft of the tension regulator arm.

#### Note

Take care not to scratch the brake band assembly because of bending.

- (4) Attach the stop washer while supporting the arm by finger.

#### Note

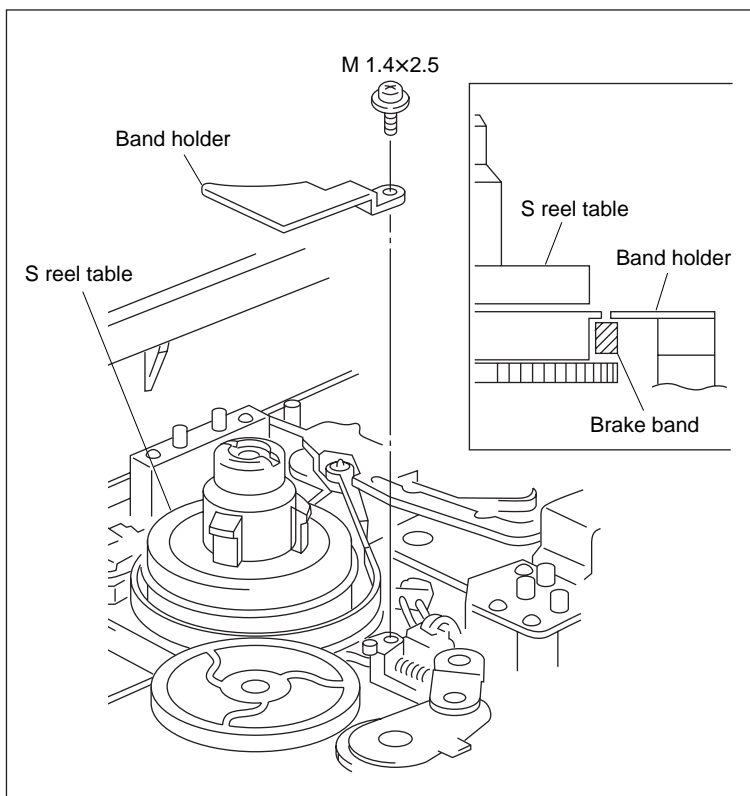
When attaching, do not press the excessive force to the tension regulator arm.

## 5. Band Holder Installation

(1) Attach the band holder shown in the figure.

### Note

- Do not pinch the brake band between band holder and S reel table.
- Do not touch the S reel table with the band holder.



## Adjustments After Replacement

### 6. Check of the Tension Regulator Operating Position

(Refer to section 4-3-1.)

### 7. FWD Back Tension Adjustment

(Refer to section 4-3-2.)

### 8. Tape Running Adjustment

(Refer to section 5-1.)

## 4-2-9. T Soft Brake Assembly Replacement

### Overviews

| Replacement                        |
|------------------------------------|
| T Soft Brake Assembly Removal      |
| T Reel Table Cleaning              |
| T Soft Brake Assembly Installation |
| Adjustment after replacement       |
| Brake Torque Check                 |

### Note

If the tape has some hunting and slack when rewinding, replace the T soft brake assembly.

### Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)
4. Remove the cassette compartment. (Refer to section 1-8 of Maintenance Manual Part 1.)

### Note

The stop washer has been used together with the T soft brake assembly when attaching the T soft brake assembly. When replacing the T soft brake assembly, prepare a new stop washer (3-726-829-01 or 3-559-408-11) and use it when attaching the T soft brake assembly.

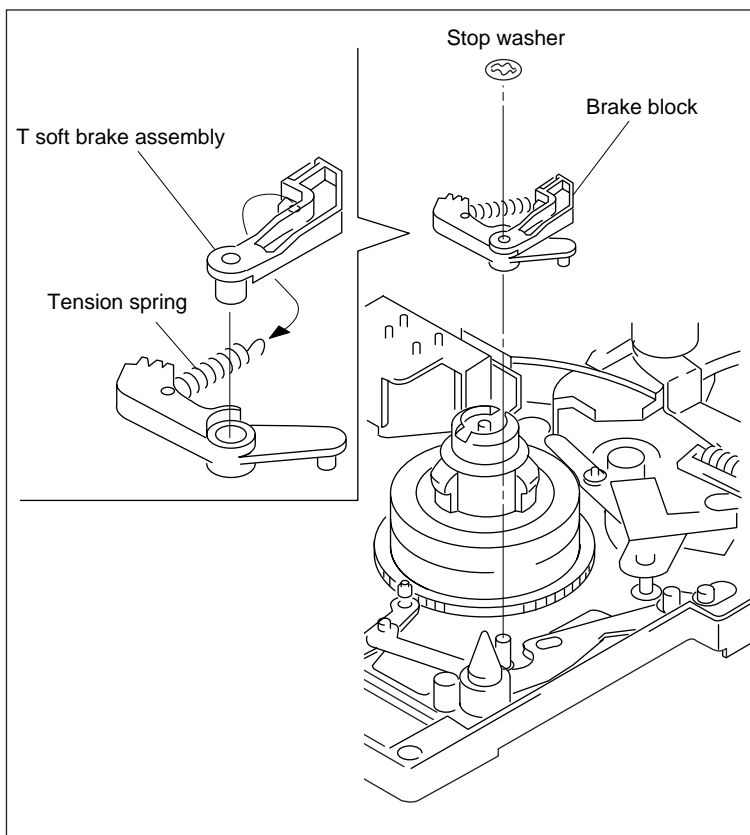
### Tools

- Stop washer fastening tool : J-6323-530-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

## Removal

### 1. T Soft Brake Assembly Removal

- (1) Remove the stop washer and the brake block.
- (2) Remove the T soft brake assembly from the brake block.
- (3) Remove the hook of the tension spring from the T soft brake.



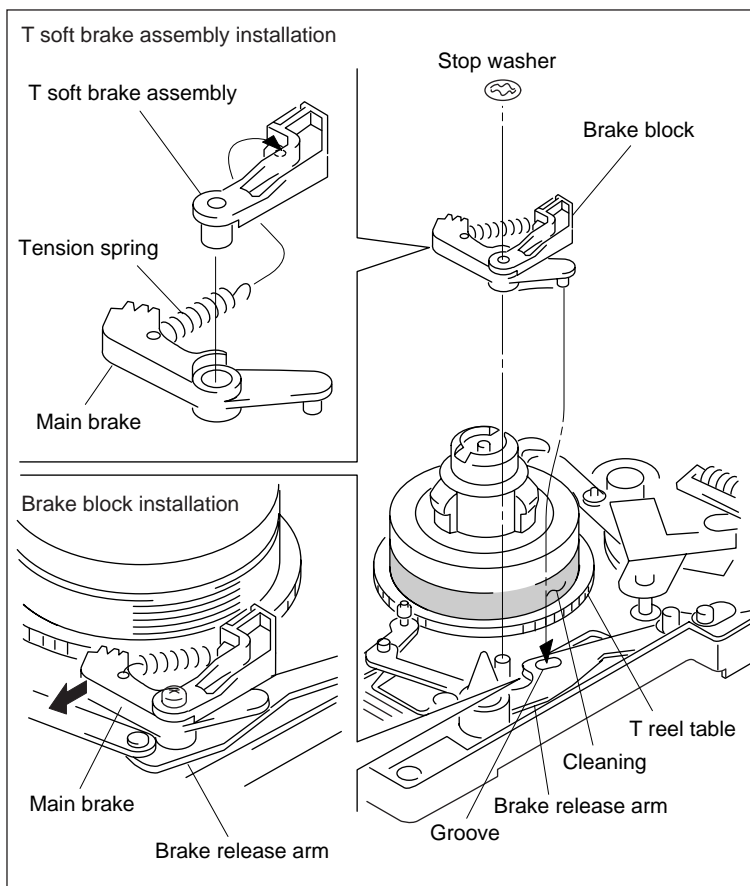
## Installation

### 2. T reel Table Cleaning

Clean the contact surface with the brake of the T reel table using a cleaning cloth moistened with cleaning fluid.

### 3. T Soft Brake Assembly Installation

- (1) Hook the tension spring to the new T soft brake assembly.
- (2) Put the boss of the T soft brake assembly in the hole of the main brake.
- (3) Put the brake block in the shaft of the chassis and move the main brake in the direction of the arrow. In this way the pin of the main brake will put in the groove of the brake release arm.
- (4) Install the stop washer.



## Adjustment After Replacement

### 4. Brake Torque Check

(Refer to section 4-3-3.)

4-2-10. S/T Idler Assembly Replacement

Overviews

| Replacement   |
|---|
| Band Holder Removal (Only when replacing the S idler assembly)      |
| S or T Idler Assembly Removal                                       |
| Cleaning of the Installation Shaft                                  |
| S or T Idler Assembly Installation                                  |
| Band Holder Installation (Only when replacing the S idler assembly) |

Notes

The S idler and the T idler assemblies are the different part, but the replacement procedures are the same. The adjustment after replacement is not needed, but the operation checks of PLAY, F.FWD and REW is needed.

Preparations

- 1. Turn the power off.
- 2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)
- 3. Remove the cassette compartment. (Refer to section 1-8 of Maintenance Manual Part 1.)

Note

The stop washer has been used together with the S and T idler assemblies when attaching the S and T idler assemblies. When replacing the S and T idler assemblies, prepare a new stop washer (3-726-829-01 or 3-559-408-11) and use it when attaching the S and T idler assemblies.

Tools

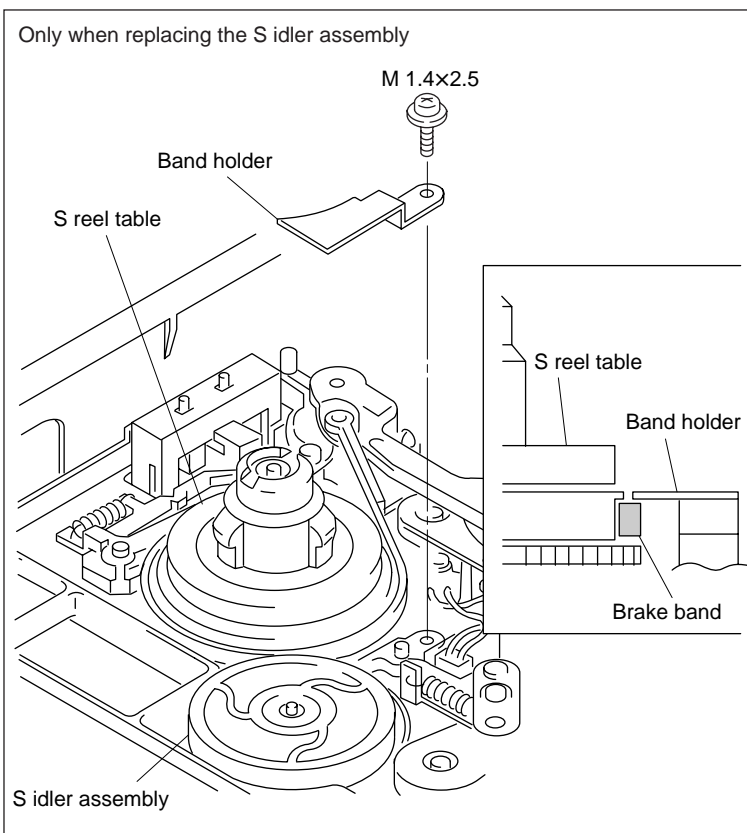
- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Stop washer fastening tool : J-6323-530-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Oil : 7-661-018-18



## Removal

### 1. Band Holder Removal (Only when replacing the S idler assembly)

Remove the screw and the band holder.



### 2. S or T Idler Assembly Removal

Remove the stop washer and the S or T idler assembly.

#### Note

Do not remove the poly-washer under the S or T idler assembly from the shaft.

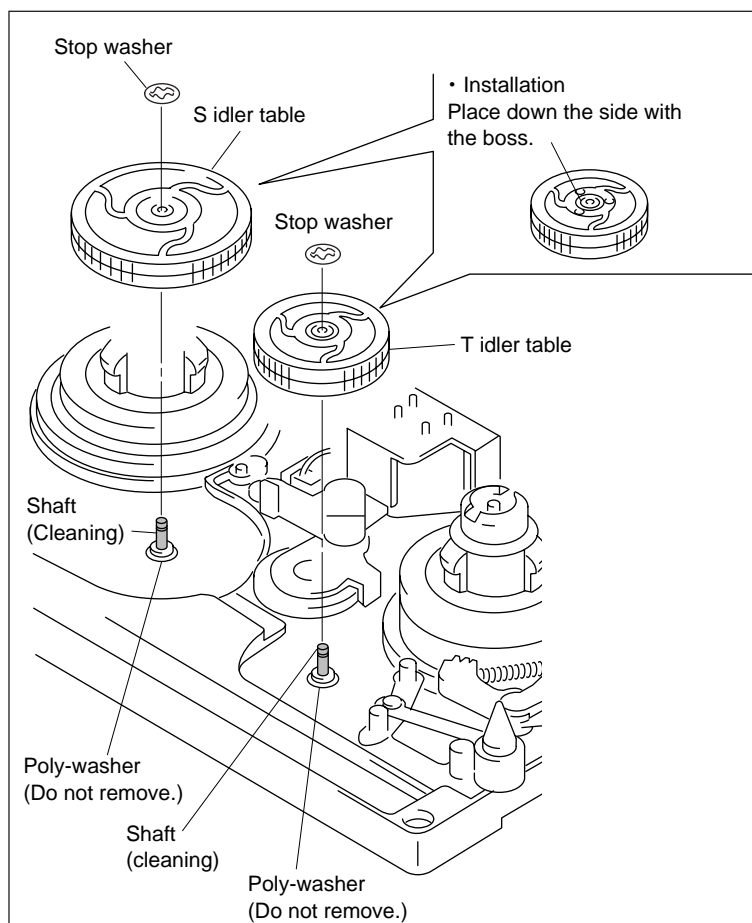
## Installation

### 3. Cleaning of the Installation Shaft

Clean the installation shaft using a cleaning cloth moistened with cleaning fluid.

### 4. S or T Idler Assembly Installation

- (1) Apply 1/4 drop of oil to the installation shaft and smear it to make a thin film.
- (2) Place down the side with the boss of the new S or T idler assembly and put in the shaft of the chassis.
- (3) Attach the stop washer.

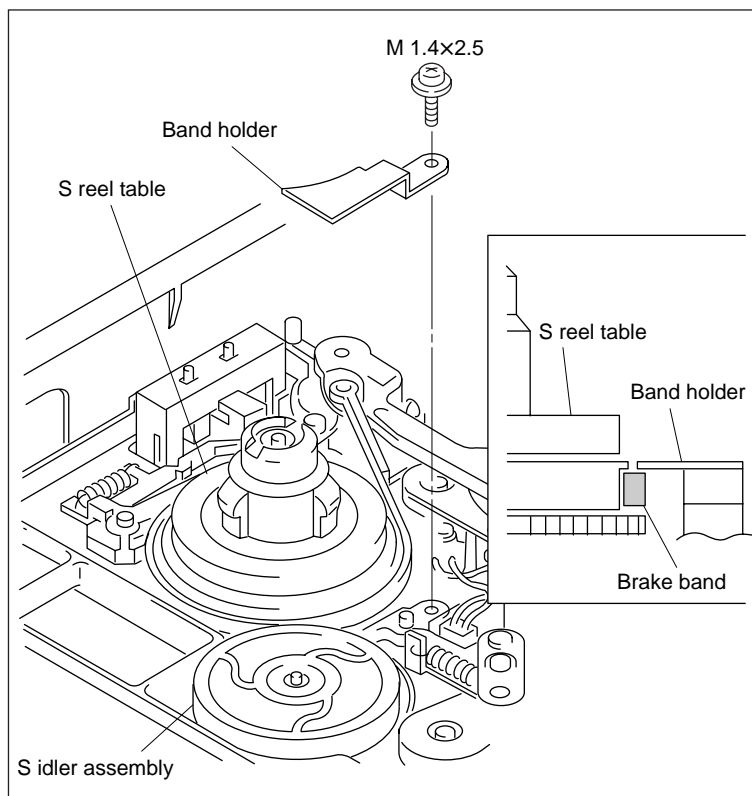


## 5. Band Holder Installation (Only when replacing the S idler assembly)

Attach the band holder as shown in the figure.

### Notes

- Do not pinch the brake band between band holder and S reel table.
- Do not touch the S reel table with the band holder.



## 4-2-11. Swing Gear Assembly Replacement

### Overviews

| Replacement                                     |
|---|
| Removal of the Swing Gear Assembly Fixing Screw |
| Mechanical Deck Assembly Removal                |
| Swing Gear Assembly Removal                     |
| Swing Gear Assembly Installation                |
| Mechanical Deck Assembly Installation           |
| Swing Gear Assembly Fixation                    |
|   |
| Adjustment after replacement                    |
| Belt tension Adjustment                         |

### Notes

When replacing, remove the mechanical deck assembly from the unit. When removing the mechanical deck assembly, take care not to scratch the video heads, drum and other parts.

### Preparations

1. Turn the power off.
2. Remove front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)
3. Remove the DC-DC converter. (Refer to section 1-8 of Maintenance Manual Part 1.)

### Tools

- Hexagon bit (across 1.5 mm) : J-6326-120-A
- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

## Removal

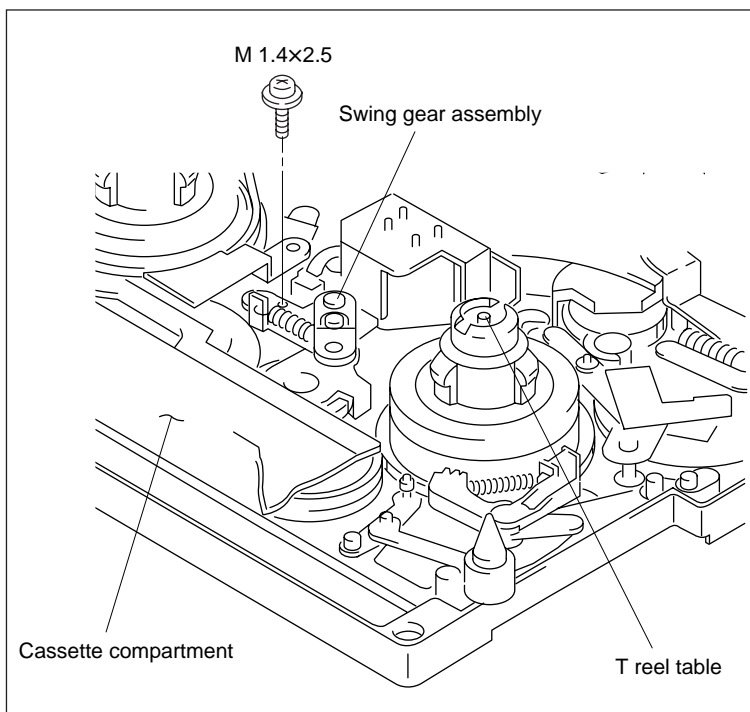
### 1. Removal of the Swing Gear Assembly Fixing Screw

(1) Remove a screw.

#### Note

Even if removing the screw, the gear assembly can not be removed from the unit.

After carrying out step 2 and removing the mechanical deck assembly, remove the swing gear assembly from the unit.



## 2. Mechanical Deck Assembly Removal

- (1) Remove the four screws shown in the figure using the hexagon bit.

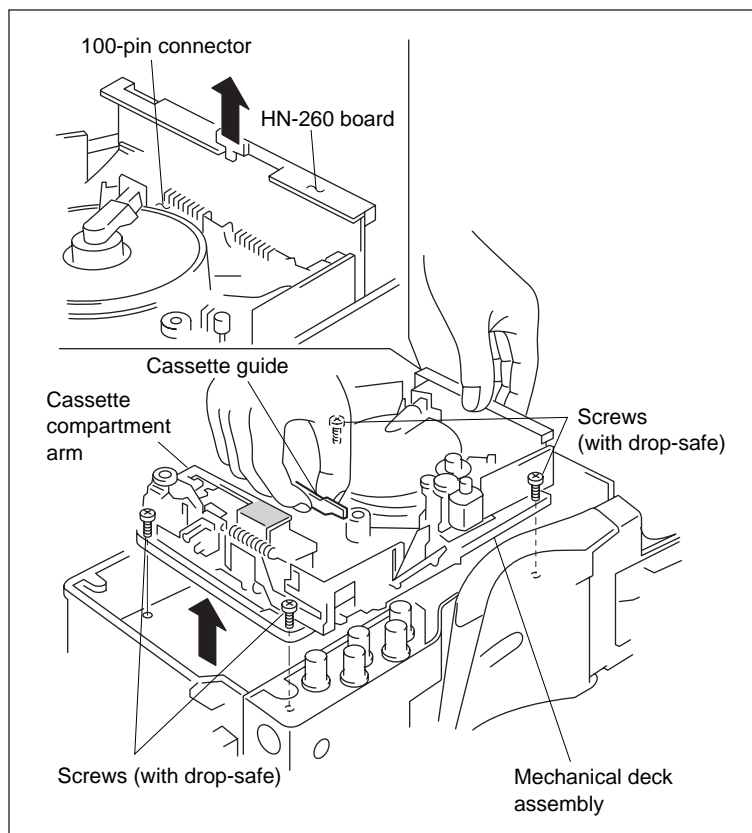
### Note

These screws can not be removed due to the drop-safe.

- (2) Lift up the ornamental bracket of the HN-260 board and disconnect the 100-pin connector that connects to the mother board at the bottom of the HN-260 board.
- (3) While holding the shaded portion of the arm on the cassette compartment, or cassette guide, and HN-260 board shown in the figure, lift up and remove the mechanical deck assembly from the unit.

### Notes

- When removing, take care not to scratch the video heads, drum and other parts.
- Never put the removed mechanical deck assembly to bottom side down or up side down on the desk.
- In the replacement, put the mechanical deck assembly as shown in the figure and carry out the following steps while holding it by hand.



### 3. Swing Gear Assembly Removal

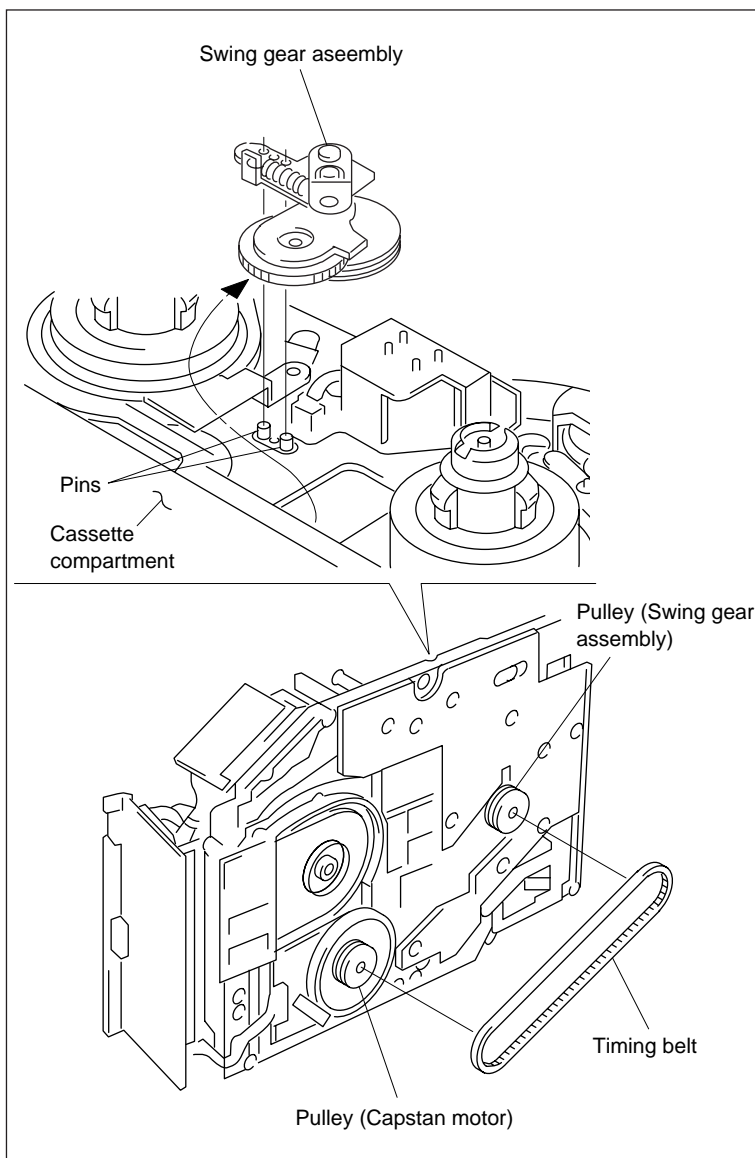
- (1) Remove the timing belt which hooks to the swing gear assembly from the back side of the mechanical deck assembly.
- (2) Remove the swing gear assembly from the top side of the mechanical deck assembly.

---

### Installation

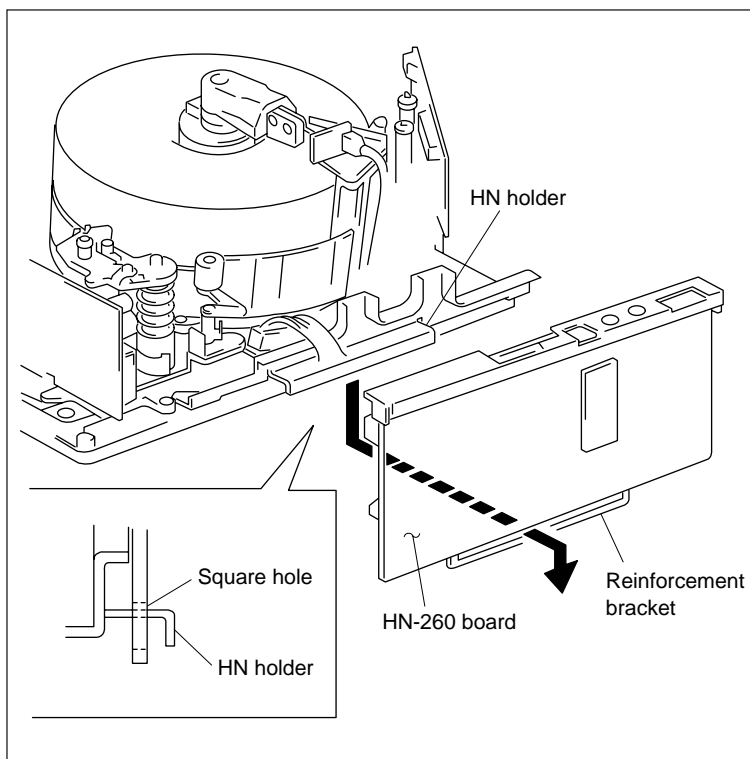
### 4. Swing Gear Assembly Installation

- (1) While putting the two holes of the new swing gear assembly in the two pins of the mechanical deck assembly, put the new swing gear assembly to the relevant position.
- (2) Attach the timing belt to the pulleys of the swing gear assembly and the capstan motor.

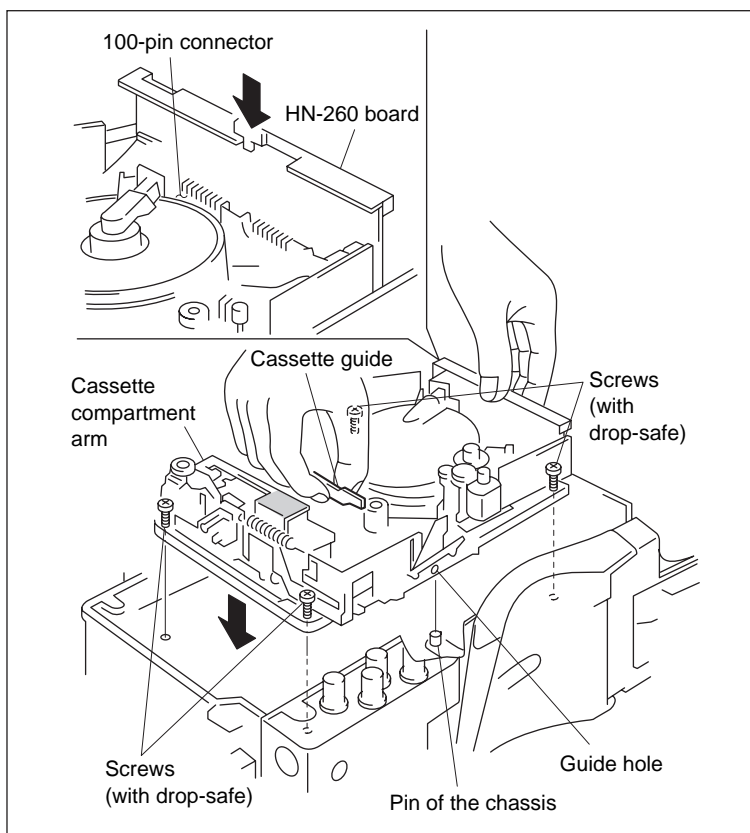


## 5. Mechanical Deck Assembly Installation

- (1) Check that the bending portion of the HN holder of the mechanical deck assembly puts in the square hole of the reinforcement bracket which attaches to the HN-260 board.



- (2) Hold the shaded portion of the arm on the cassette compartment, or cassette guide, and HN-260 board shown in the figure and align the two guide holes on the mechanical deck assembly with the two pins of the chassis.
- (3) Push down the ornamental bracket of the HN-260 board and connect the 100-pin connector to the mother board.
- (4) Tighten the four screws of the mechanical deck assembly.



## **6. Swing Gear Assembly Fixation**

After checking that the two pins of the mechanical deck assembly put in the two holes of the swing gear assembly, tighten the screw.

---

## **Adjustment After Replacement**

## **7. Belt Tension Adjustment**

(Refer to section 4-3-4.)



## 4-2-12. Timing Belt Replacement

### Overviews

| Replacement                           |
|---------------------------------------|
| Mechanical Deck Assembly Removal      |
| Timing Belt Removal                   |
| Cleaning of the Pulleys               |
| Timing Belt Installation              |
| Mechanical Deck Assembly Installation |
| Adjustment after replacement          |
| Belt Tension Adjustment               |

### Notes

When replacing, remove the mechanical deck assembly from the unit. When removing the mechanical deck assembly, take care not to scratch the video heads, drum and other parts.

### Preparations

1. Turn the power off.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)
3. Remove the DC-DC converter. (Refer to section 1-8 of Maintenance Manual Part 1.)

### Tools

- Hexagon bit (across 1.5 mm) : J-6326-120-A
- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

## Removal

### 1. Mechanical Deck Assembly Removal

- (1) Remove the four screws shown in the figure using the hexagon bit.

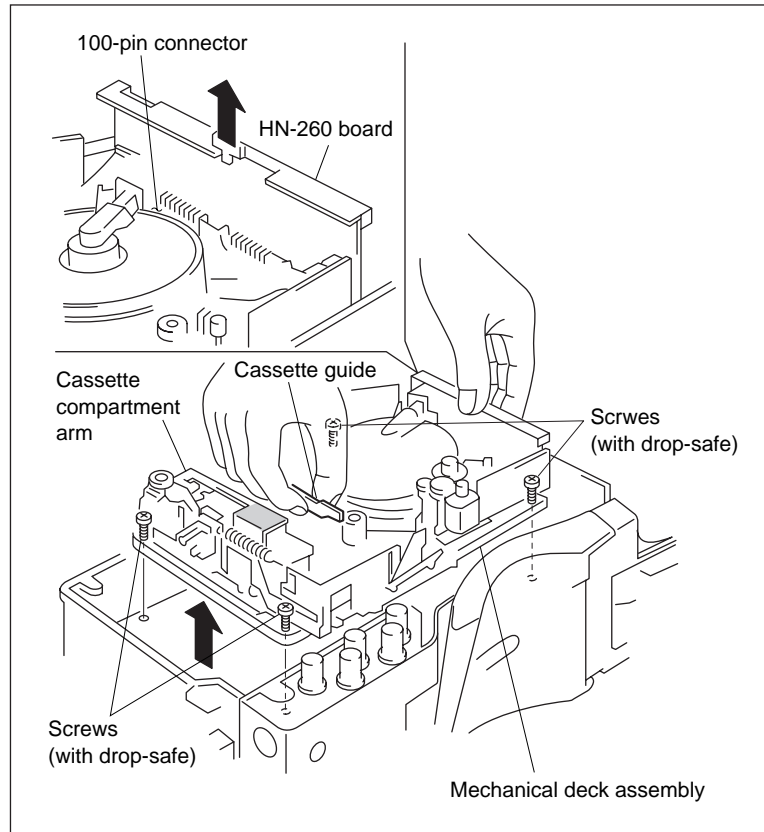
#### Note

These screws can not be removed due to the drop-safe.

- (2) Lift up the ornamental bracket of the HN-260 board and disconnect the 100-pin connector that connects to the mother board at the bottom of the HN-260 board.
- (3) While holding the shaded portion of the arm on the cassette compartment, or cassette guide, and HN-260 board shown in the figure, lift up and remove the mechanical deck assembly from the unit.

#### Notes

- When removing, take care not to scratch the video heads, drum and other parts.
- Never put the removed mechanical deck assembly to bottom side down or up side down on the desk.
- In the replacement, put the mechanical deck assembly as shown in the figure and carry out the following steps while holding it by hand.



## 2. Timing Belt Removal

- (1) Loosen the screw of the swing gear assembly.
- (2) Remove the timing belt.

---

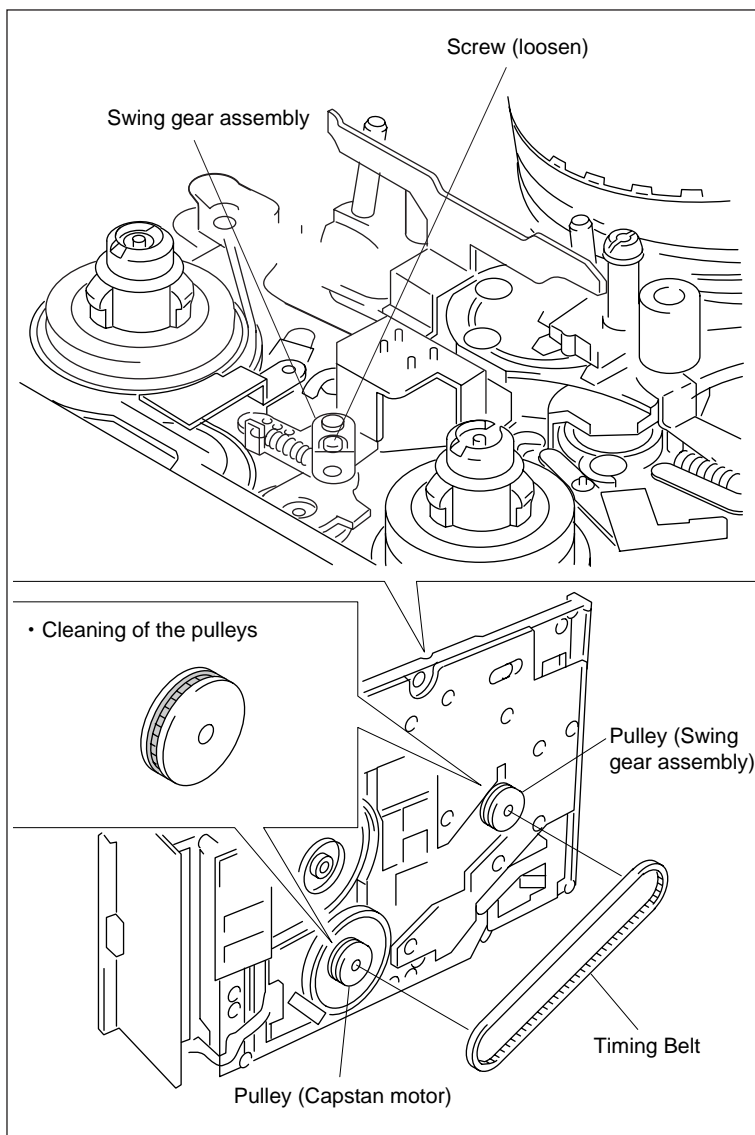
## Installation

### 3. Cleaning of the Pulleys

Clean the pulleys of the swing gear assembly and capstan motor using a cleaning cloth moistened with cleaning fluid.

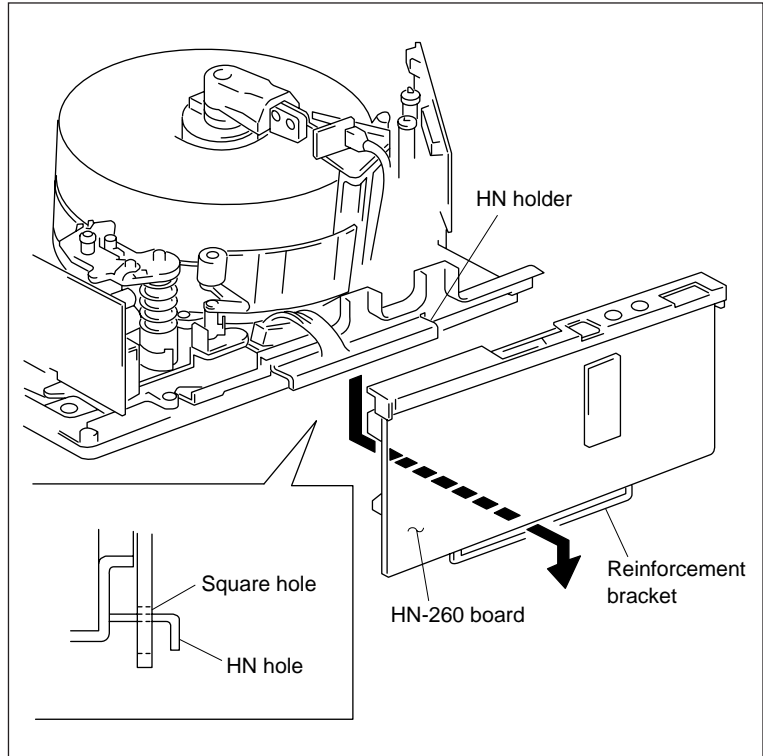
### 4. Timing Belt Installation

Attach the timing belt to the pulleys of the swing gear assembly and capstan motor.

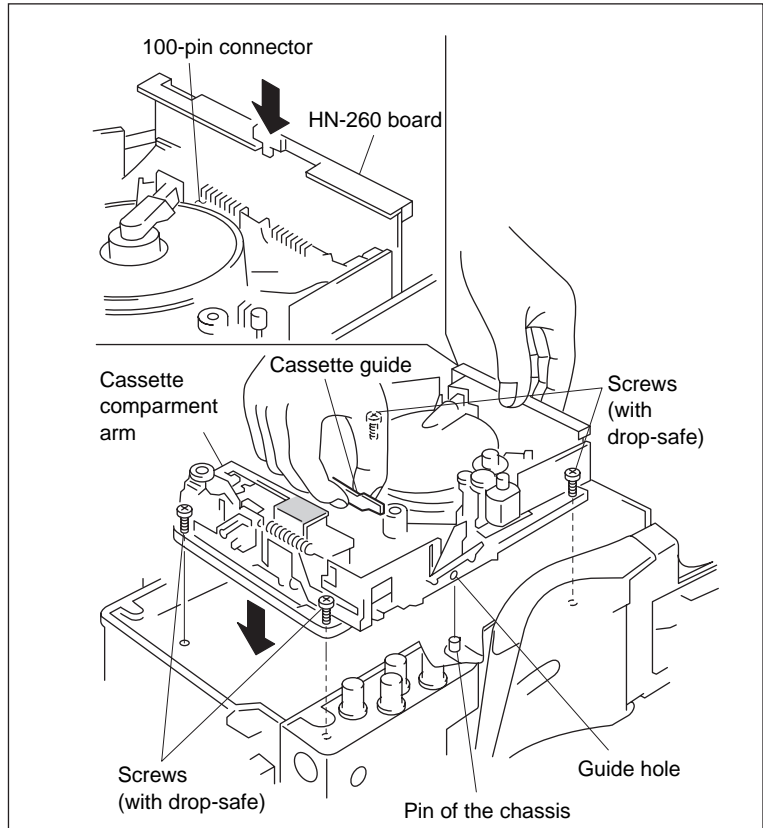


## 5. Mechanical Deck Assembly Installation

- (1) Check that the bending portion of the HN holder of the mechanical deck assembly puts in the square hole of the reinforcement bracket which attaches to the HN-260 board.



- (2) Hold the shaded portion of the arm on the cassette compartment, or cassette guide, and HN-260 board shown in the figure and align the two guide holes on the mechanical deck assembly with the two pins of the chassis.
- (3) Push down the ornamental bracket of the HN-260 board and connect the 100-pin connector to the mother board.
- (4) Tighten the four screws of the mechanical deck assembly.



## Adjustment After Replacement

## 6. Belt Tension Adjustment

(Refer to section 4-3-4.)

## 4-2-13. Capstan Motor Replacement

### Overviews

| Replacement                           |
|---------------------------------------|
| Manual Eject Assembly Removal         |
| Mechanical Deck Assembly Removal      |
| Capstan Motor Removal                 |
| Capstan Motor Installation            |
| Mechanical Deck Assembly Installation |
| Manual Eject Assembly Installation    |
|                                       |
| Adjustments after replacement         |
| Belt tension Adjustment               |
| Automatic Servo Adjustment            |

### Notes

When replacing, remove the mechanical deck assembly from the unit. When removing the mechanical deck assembly, take care not to scratch the video heads, drum and other parts.

### Preparations

1. Turn the power off.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)
3. Remove the DC-DC converter. (Refer to section 1-16 of Maintenance Manual Part 1.)

### Tools

- Hexagon bit (across 1.5mm) : J-6326-120-A
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3kg) : J-6325-400-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

## Removal

### 1. Manual Eject Assembly Removal

Remove the screw and the manual eject assembly.  
(Refer to section 4-1-3.)

### 2. Mechanical Deck Assembly Removal

- (1) Remove the four screws shown in the figure using the hexagon bit.

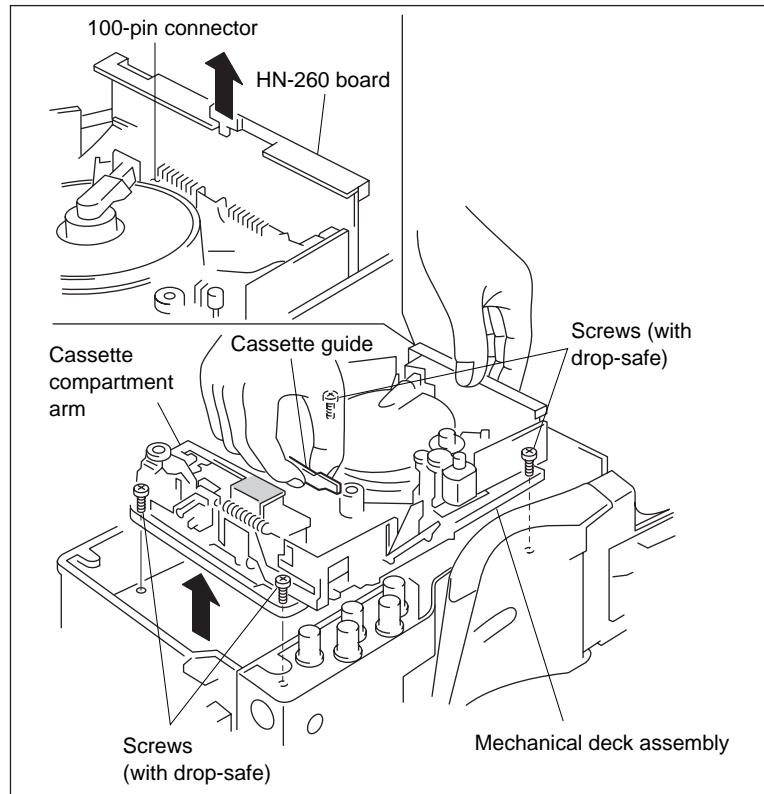
**Note**

These screws can not be removed due to the drop-safe.

- (2) Lift up the ornamental bracket of the HN-260 board and disconnect the 100-pin connector that connects to the mother board at the bottom of the HN-260 board.
- (3) While holding the shaded portion of the arm on the cassette compartment, or cassette guide, and HN-260 board shown in the figure, lift up and remove the mechanical deck assembly from the unit.

**Notes**

- When removing, take care not to scratch the video heads, drum and other parts.
- Never put the removed mechanical deck assembly to bottom side down or up side down on the desk.
- In the replacement, put the mechanical deck assembly as shown in the figure and carry out the following steps while holding it by hand.



### 3. Capstan Motor Removal

- (1) Loosen the screw of the swing gear assembly.
- (2) Remove the timing belt which hooks to the capstan motor pulley.
- (3) Disconnect the connectors which connect to the board of the capstan motor.
- (4) While holding the capstan motor by hand, remove the three screws from the top surface of the mechanical deck assembly and remove the capstan motor from the back side of the mechanical deck assembly.

#### Note

Take care not to fall the capstan motor.

### Installation

#### 4. Capstan Motor Installation

- (1) Place the new capstan motor in the direction of the figure, and put the capstan motor through the hole of the mechanical deck assembly and tighten the three screws.

#### Note

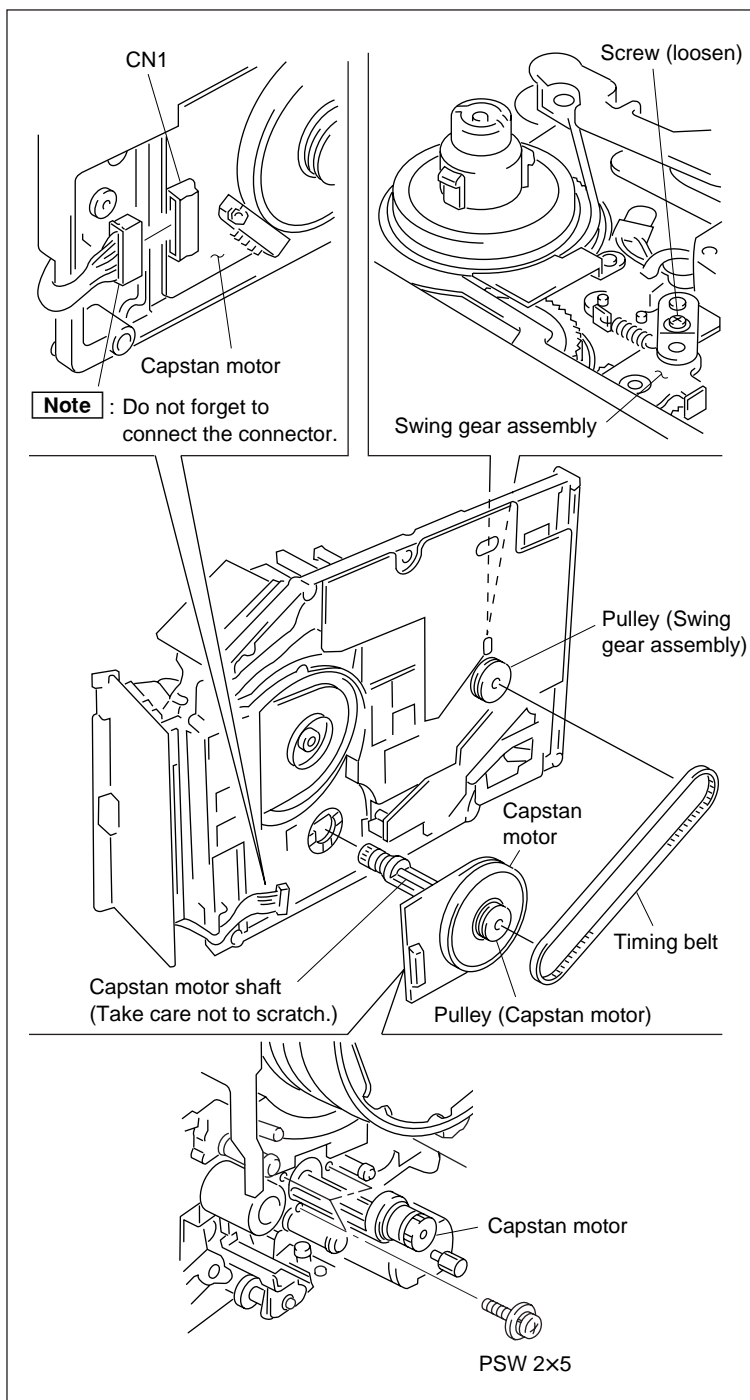
When putting through the hole, take care not to scratch the capstan motor shaft.

- (2) Connect the connectors on the board of the capstan motor.

#### Note

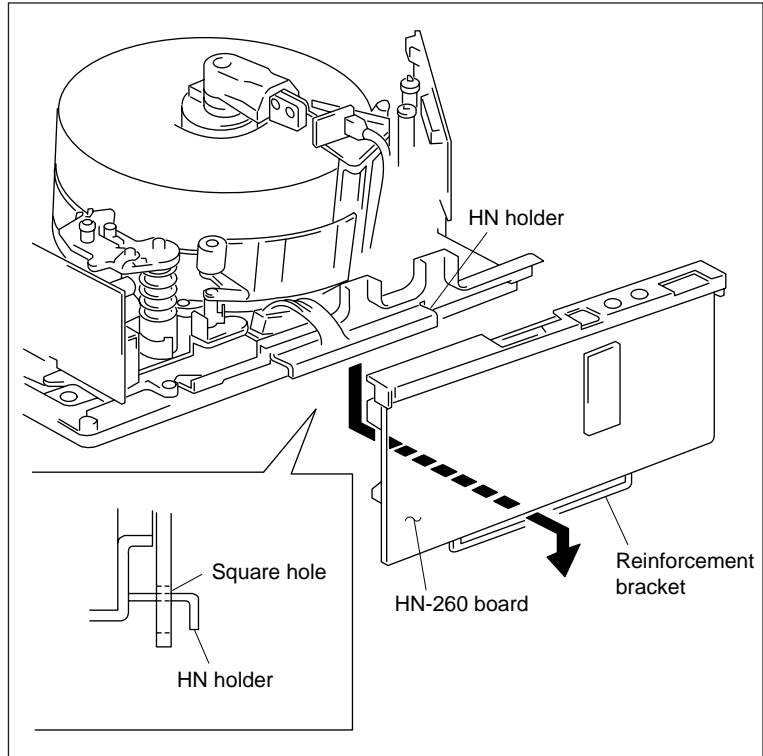
Do not forget to connect three connectors.

- (3) Attach the timing belt to the pulleys of the swing gear assembly and the capstan motor.

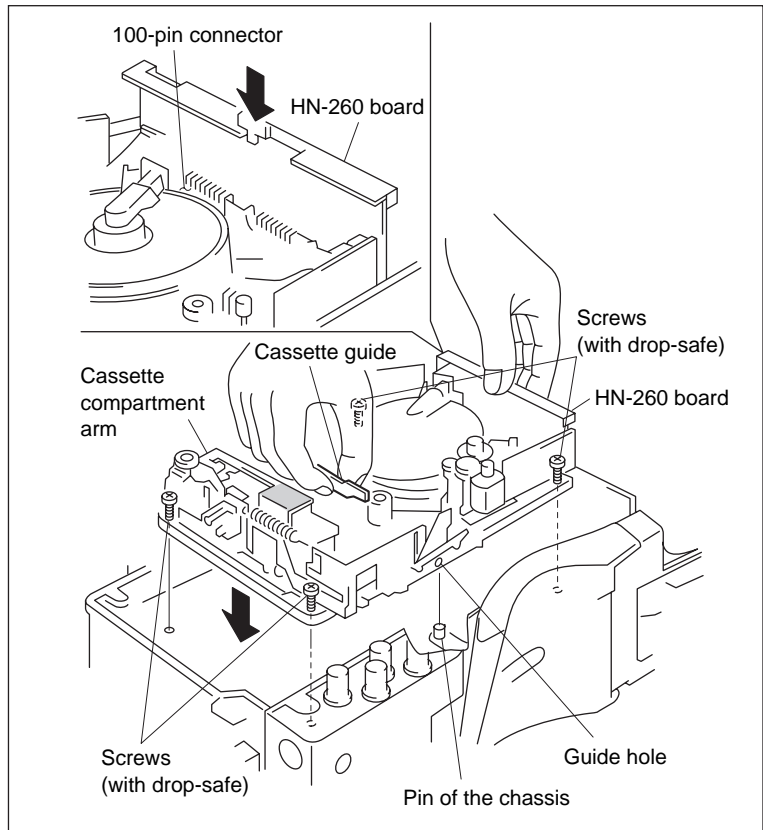


## 5. Mechanical Deck Assembly Installation

- (1) Check that the bending portion of the HN holder of the mechanical deck assembly puts in the square hole of the reinforcement bracket which attaches to the HN-260 board.



- (2) Hold the shaded portion of the arm on the cassette compartment, or cassette guide, and HN-260 board shown in the figure and align the two guide holes on the mechanical deck assembly with the two pins of the chassis.
- (3) Push down the ornamental bracket of the HN-260 board and connect the 100-pin connector to the mother board.
- (4) Tighten the four screws of the mechanical deck assembly.





## **6. Manual Eject Assembly Installation**

- (1) Attach the manual eject assembly.  
(Refer to section 4-1-3.)
- (2) While pressing down the knob of the manual eject assembly, turn it in the direction or reverse direction of the arrow. When turning it, check that the gears can be correctly engaged and turned.

---

## **Adjustments After Replacement**

### **7. Belt Tension Adjustment**

(Refer to section 4-3-4.)

### **8. Automatic Servo Adjustment**

(Refer to section 6-3-1.)

4-2-14. CTL Head Replacement

Overviews

| Replacement                         |
|-------------------------------------|
| Entrance Head Assembly Removal      |
| CTL Head Replacement                |
| Entrance Head Assembly Installation |
| Entrance Head Assembly Cleaning     |
|                                     |
| Adjustments after replacement       |
| Tape Running Adjustment             |
| Video Tracking Adjustment           |
| CTL Head Height Adjustment          |
| CTL Head Position Adjustment        |
| CUE/TC Head Position Adjustment     |

Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

Tools

- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver bit (for 3 kg) : J-6325-400-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

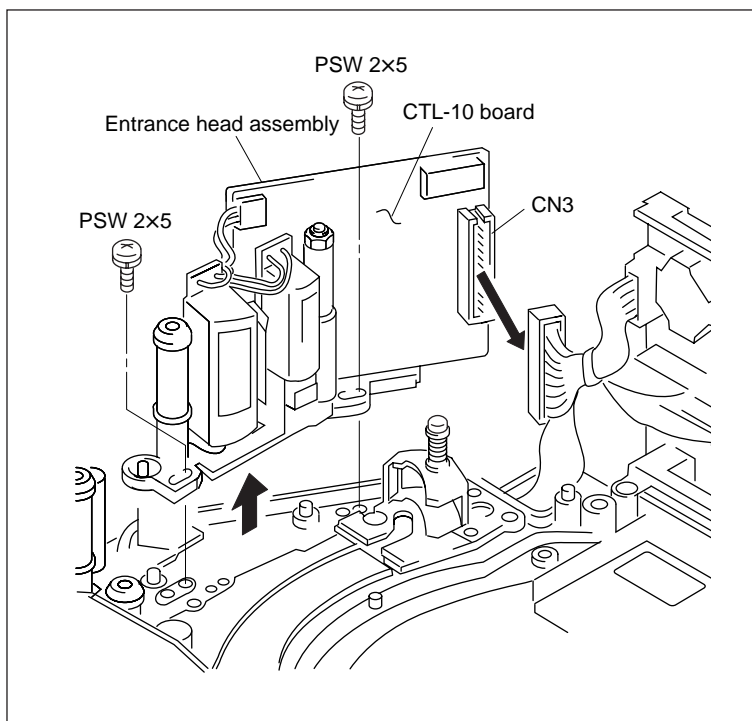
## Removal

### 1. Entrance Head Assembly Removal

- (1) Disconnect the connector CN3 on the CTL-10 board.
- (2) Remove the two screws and the entrance head assembly from the unit.

#### Note

Take care not to scratch the video heads, drum, erase head, tape guides and other parts.



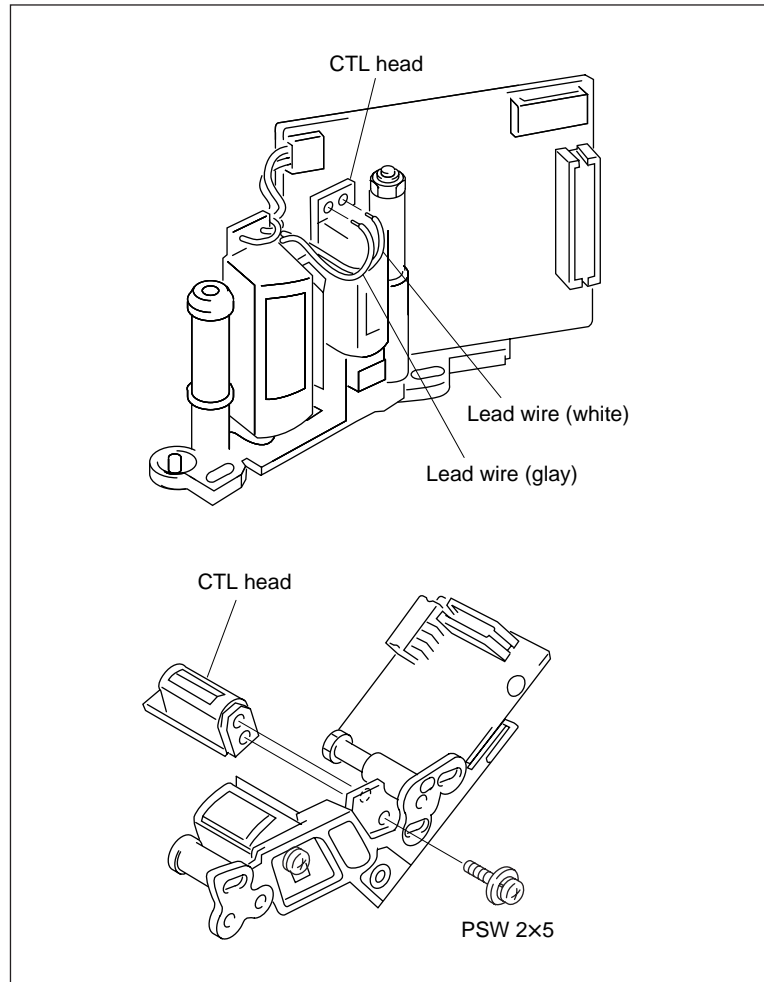
## Installation

### 2. CTL Head Replacement

- (1) Desolder the two leads from the CTL head.
  - (2) Remove the screw at the back side of the CTL head assembly and the CTL head.
  - (3) Put the boss of CTL bracket in the hole at the bottom of the new CTL head and tighten the screw.
  - (4) Solder the two leads to the printed circuit board of the CTL head.
- (Refer to the (1) in the step 2.)

#### Note

Never mistake the soldering positions. If mistaking, the serious tape interchange ability trouble will occur.



### 3. Entrance Head Assembly Installation

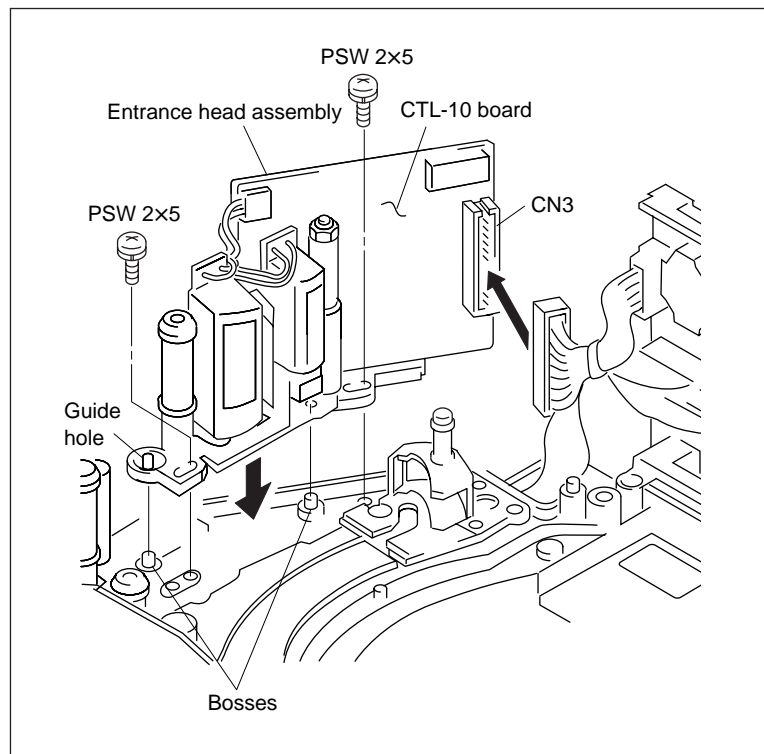
- (1) Put the two bosses of the chassis in the two reference guide holes of the entrance head assembly and tighten the two screws.
- (2) Connect the harness connector to the connector CN3 on the CTL-10 board.

### 4. Entrance Head Assembly Cleaning

Clean the CTL head, erase head, cleaning blade and tape guides using a cleaning cloth moistened with cleaning fluid.

#### Note

After cleaning, be sure to wipe using a dry cleaning cloth.



---

## **Adjustments After Replacement**

### **5. Tape Running Adjustment**

(Refer to section 5-1.)

### **6. Video Tracking Adjustment**

(Refer to section 5-2.)

### **7. CTL Head Height Adjustment**

(Refer to section 5-3.)

### **8. CTL Head Position Adjustment**

(Refer to section 5-4.)

### **9. CUE/TC Head Position Adjustment**

(Refer to section 5-8.)

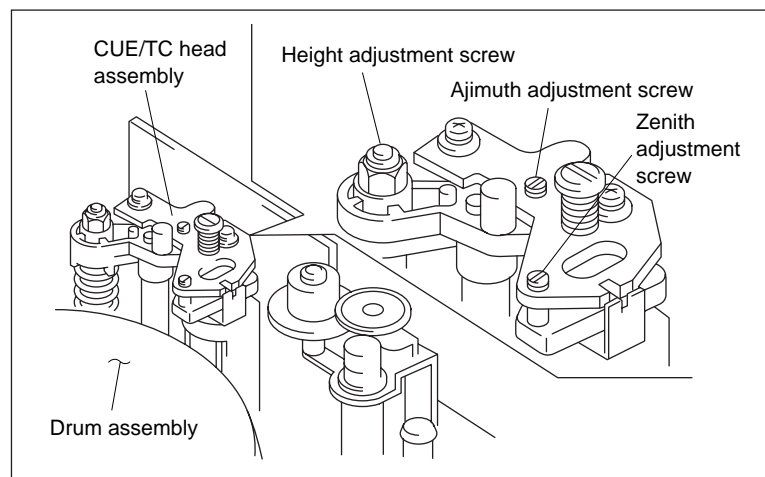
## 4-2-15. CUE Head Replacement

### Overviews

| Replacement                        |
|------------------------------------|
| Manual Eject Assembly Removal      |
| Cassette Compartment Removal       |
| Gear Block Assembly Removal        |
| CUE Head Block Removal             |
| CUE Head Replacement               |
| CUE Head Block Installation        |
| Gear Block Assembly Installation   |
| Cleaning of the Head               |
| Cassette Compartment Installation  |
| Manual Eject Assembly Installation |
| Operation Check                    |
| Adjustments after replacement      |
| Tape Running Check                 |
| Video Tracking Adjustment          |
| CUE Head Height Adjustment         |
| CTL Head Position Adjustment       |
| CUE/TC Head Position Adjustment    |
| Audio System Adjustment            |

### Notes

When replacing, never tighten or loosen other screws except the relevant screws shown in the figure. If tightening or loosening, the azimuth and zenith of the CUE head will change, and the serious trouble will occur at the tape path and video tracking adjustments.



## Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and the outside panel. (Refer to section 1-5 of Maintenance Manual Part 1.)

### Note

The stop washer has been used together with the CUE head block when attaching the CUE head block. When replacing the CUE head block, prepare a new stop washer (3-726-829-01 or 3-559-408-11).

## Tools

- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3kg) : J-6325-400-A
- Stop washer fastening tool : J-6323-530-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

## Removal

### 1. Manual Eject Assembly Removal

Remove the screw and the manual eject assembly. (Refer to section 4-1-3.)

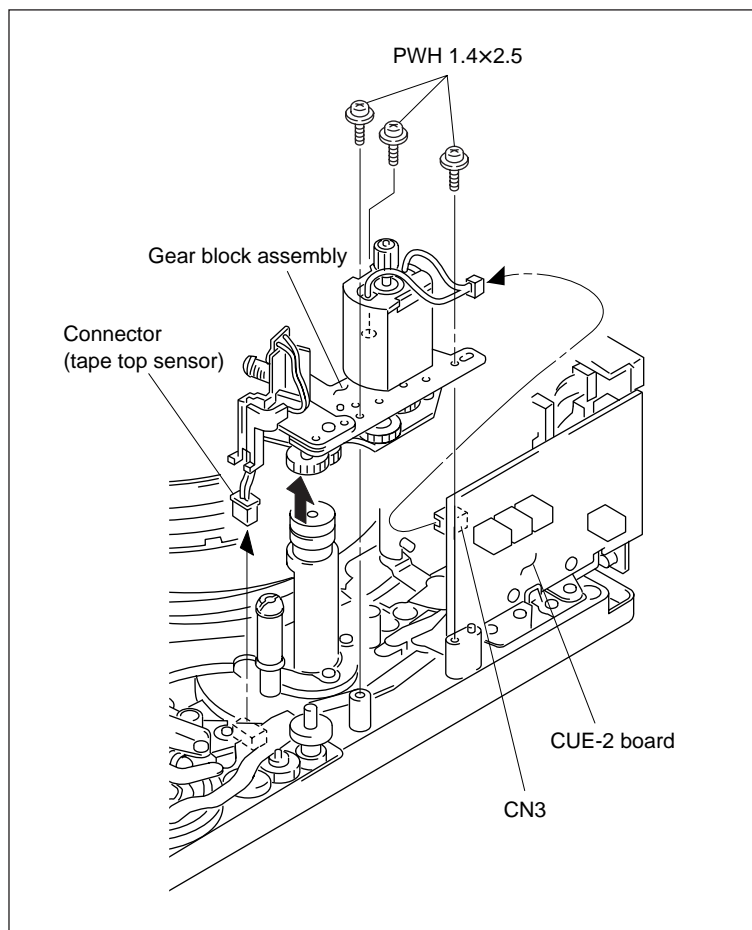
### 2. Cassette Compartment Removal

Remove the three screws and the cassette compartment. (Refer to section 1-8 of Maintenance Manual Part 1.)

### 3. Gear Block Assembly Removal

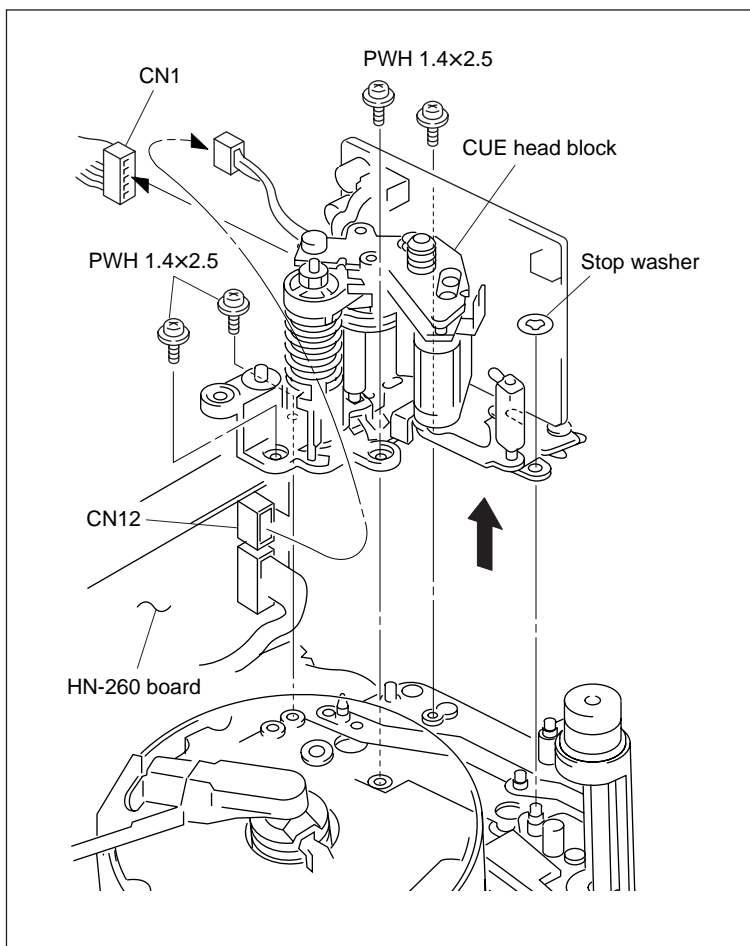
- (1) Disconnect the connector CN3 on the CUE-2 board which attaches to the CUE head block.
- (2) Remove the three screws.
- (3) Lift up the gear block assembly and disconnect the connector of the tape top sensor from the SE-210 board.

In this way the gear block assembly will remove.



#### 4. CUE Head Block Assembly Removal

- (1) Disconnect the connector CN12 on the HN-260 board.
- (2) Remove the VH cleaner assembly.  
(Refer to section 4-2-6.)
- (3) Remove the four screws and the stop washer on the CUE cleaner link and remove the CUE head block.
- (4) Disconnect the connector CN1 on the CUE-2 board.





## Installation

### 5. CUE Head Replacement

- (1) Disconnect the connector CN2 on the CUE-2 board.

- (2) Remove the screw and open the CUE-2 board.

- (3) Remove the two screws at the top of the CUE head block and the CUE head.

In this way the shield case and the adjustment plate (R) are removed.

- (4) Desolder the four leads from the printed circuit board of the CUE head, and re-solder them to the new CUE head.

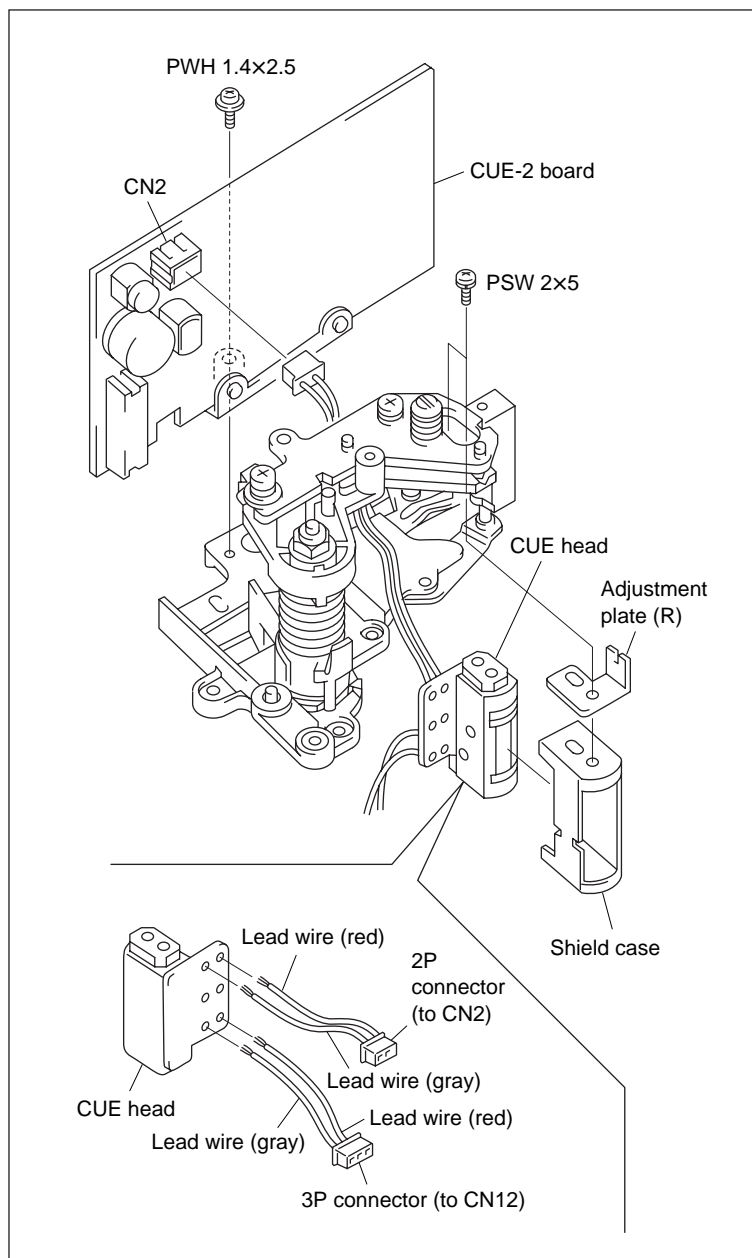
**Note**

Never mistake the soldering positions.

- (5) After putting the new CUE head in the shield case, assemble the parts in the sequence shown in the figure and tighten the two screws.

- (6) Attach the CUE-2 board using the two screws.

- (7) Connect the harness connector from the CUE head to the connector CN2 on the CUE-2 board.



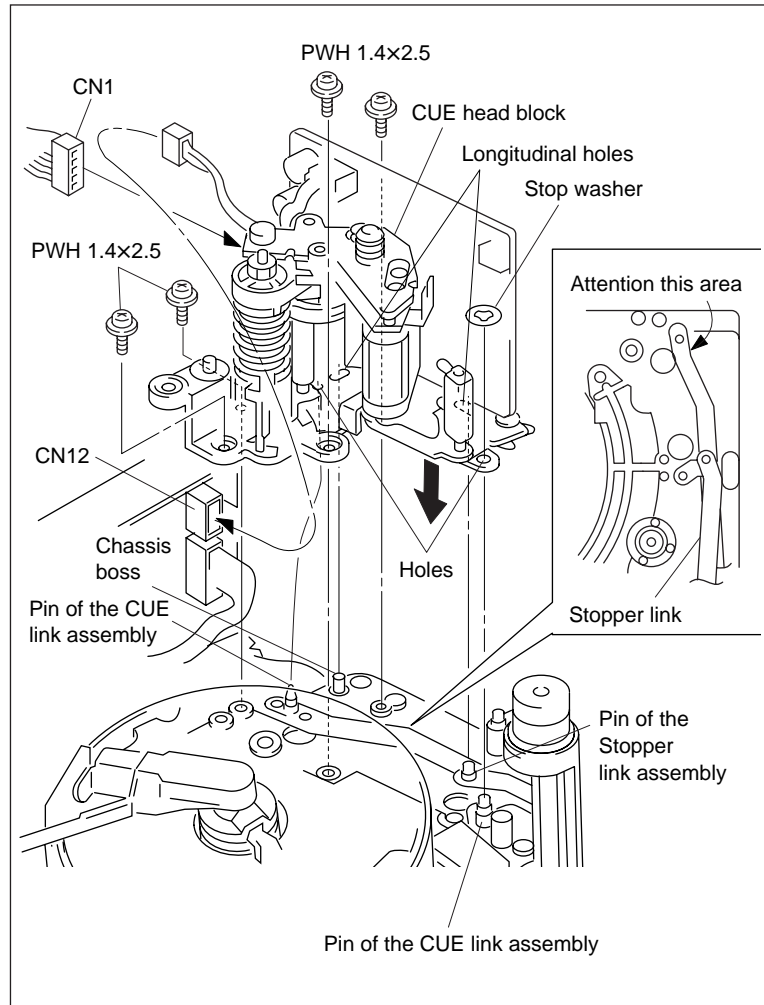
## 6. CUE Head Block Installation

- (1) Align the CUE link assembly with the position shown in the figure by hand.

### Note

In this way the following steps will easily carried out.

- (2) Put the two pins of the CUE link assembly in the two holes of the CUE head block. Put the pins of the stopper link and chassis in the two longitudinal holes of the CUE head block.
- (3) Attach the CUE head block to the chassis using the four screws.
- (4) Attach the stop washer to the pin of the CUE link assembly.
- (5) Connect the harness connectors to the connectors CN12 on the HN-260 board and CN1 on the CUE-2 board.



## 7. Gear Block Assembly Installation

- (1) While connecting the connector of the tape top sensor that connects to the gear block assembly to the connector on the SE-210 board which is attached to the chassis, put the pin of the chassis in the longitudinal hole of the gear block assembly and the top of the joint gear that is attached to the chassis in the round hole of the gear block assembly. Tighten the three screws.

### Note

Check that the connector connects to the SE-210 board.

- (2) Connect the harness connector to the connector CN3 on the CUE-2 board.
- (3) Attach the VH cleaner assembly.  
(Refer to section 4-2-6.)

## 8. Cleaning of the Head

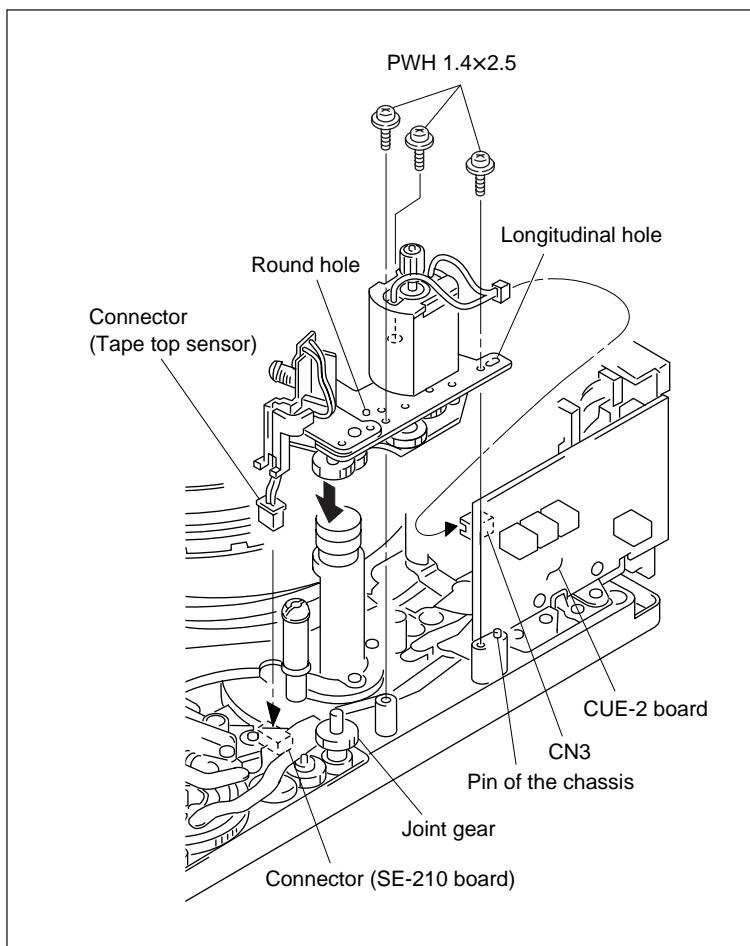
Clean the CUE head using a cleaning cloth moistened with cleaning fluid.

### Note

After cleaning, be sure to wipe using a dry cleaning cloth.

## 9. Cassette Compartment Installation

Attach the cassette compartment using the three screws. (Refer to section 1-8 of Maintenance Manual Part 1.)



## **10 Manual Eject Assembly Installation**

Attach the manual eject assembly.

(Refer to section 4-1-3.)

## **11. Operation Check**

When turning the manual eject gear clockwise and counterclockwise while pressing down it, check that the cleaning roller assembly moves and cleans the CUE head.

---

## **Adjustments After Replacement**

### **12. Tape Running Adjustment**

(Refer to section 5-1.)

### **13. Video Tracking Adjustmen**

(Refer to section 5-2.)

### **14. CUE Head Height Adjustment**

(Refer to section 5-5.)

### **15. CTL Head Position Adjustment**

(Refer to section 5-4.)

### **16. CUE/TC Head Position Adjustment**

(Refer to section 5-8.)

### **17. Audio System Adjustment**

(Refer to section 6-4-4 to 6-4-6.)

## 4-2-16. Reel Table Replacement

### Overviews

| Replacement                   |
|-------------------------------|
| Reel Table Removal            |
| Reel Shaft Cleaning           |
| Reel Table Cleaning           |
| Reel Table Installation (1)   |
| Reel Table Height Adjustment  |
| Reel Table Installation (2)   |
| Operation Check               |
| Adjustments after replacement |
| FWD Back Tension Adjustment   |
| Brake Torque Check            |
| Tape Running Adjustment       |

### Notes

- Replacement of real table requires the new stop washer. When replacing the real table, prepare a new stop washer.  
Stop washer 1.2 : 3-726-829-01 (1 piece is used.)
- The each five poly washers are attached at the top and bottoms of the S reel table and the T reel table.) The poly washers at the top of the reel table are the spare parts the reel table replacement. Take care not to lose or break.  
Poly washer (0.13 mm thick) : 3-303-961-01
- The height of the S and T reel tables are to be made the reference for the tape running system. After replacing the S or T reel table, be sure to carry out the S or T reel table height adjustment.

### Preparations

1. Check that the unit is in the unthreading and mode.
2. Turn the power off.
3. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)
4. Remove the cassette compartment. (Refer to section 1-8 of Maintenance Manual Part 1.)

## Tools

- Stop washer fastening tool : J-6323-530-A
- FWD back tension measuring cassette tape : J-6323-890-A
- Reel table hight gauge : J-6324-150-A
- Reel table height gauge : J-7032-610-A
- Cassette reference plate (1) : J-6324-170-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

## Removal

### 1. Reel Table Removal

#### S reel table removal

- (1) Remove the band holder.
- (2) Remove the stop washer 1.2 and the brake band from the tension regulator arm.
- (3) Move the brake band to the S idler side.

#### Note

Do not bend the brake band. Do not put the oil onto the felt surface.

- (4) Remove the one stop washer 1.2 that attaches the S reel table using a pair of tweezers (or equivalent).
- (5) Remove the one to three poly washer (s) at the top of the S reel table.
- (6) Pull out the S reel table while releasing the S soft brake and the brake band by finger from the S reel table.

#### Note

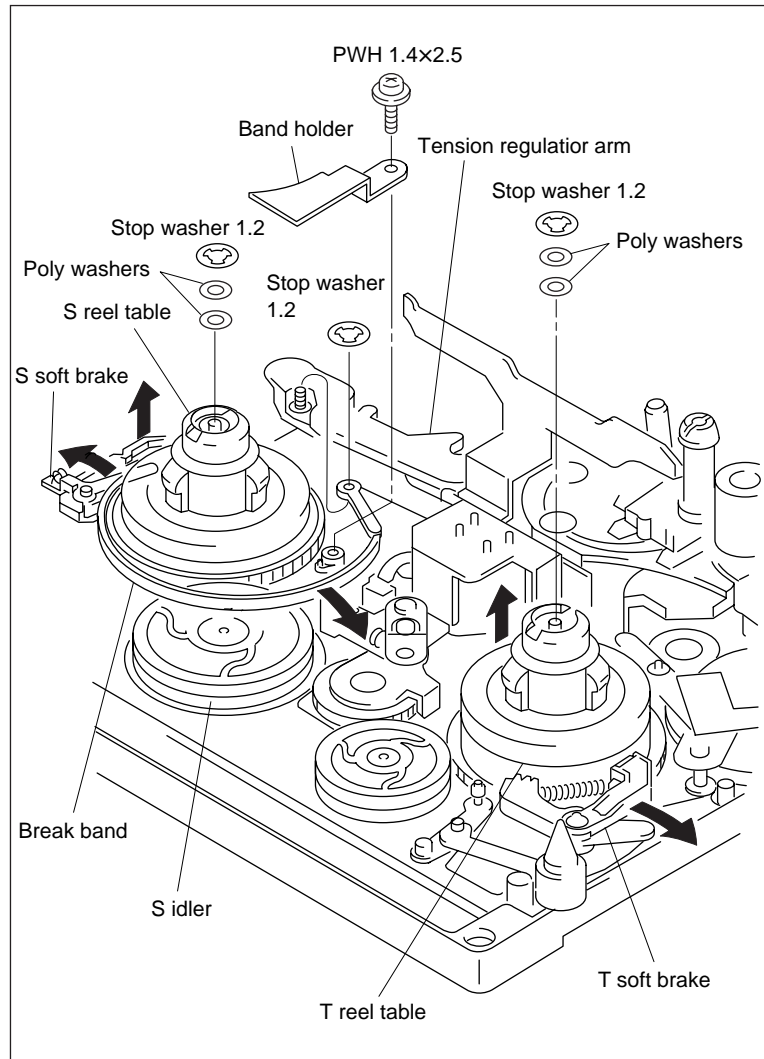
Do not touch the felt surface of the brake band by finger.

#### T reel table removal

- (1) Remove the one stop washer 1.2 that attaches the T reel table.
- (2) Remove the one to three stop washer (s) at the top of the T reel table.
- (3) Pull out the T reel table while releasing the T soft brake by finger from the T reel table.

#### Note

If the poly washers are attached together with the bottom of the reel table, return the all poly washers to the reel shaft.



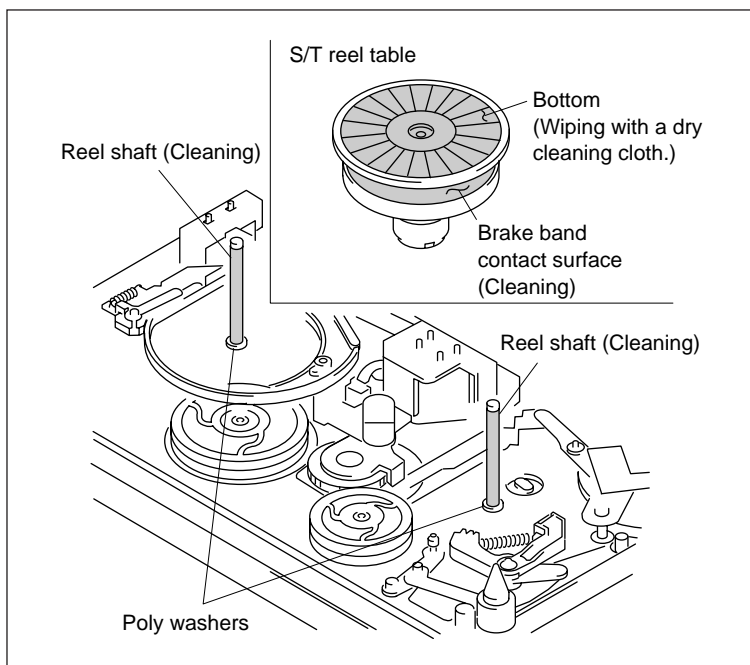
## Installation

### 2. Reel Shaft Cleaning

Clean the reel shaft using a cleaning cloth moistened with cleaning fluid.

### 3. Reel Table Cleaning

- (1) Clean the contact surfaces of the reel table with the brake band using a cleaning cloth moistened with cleaning fluid.
- (2) Wipe the bottom sides of the reel table using a dry cleaning cloth.



### 4. Reel Table Installation (1)

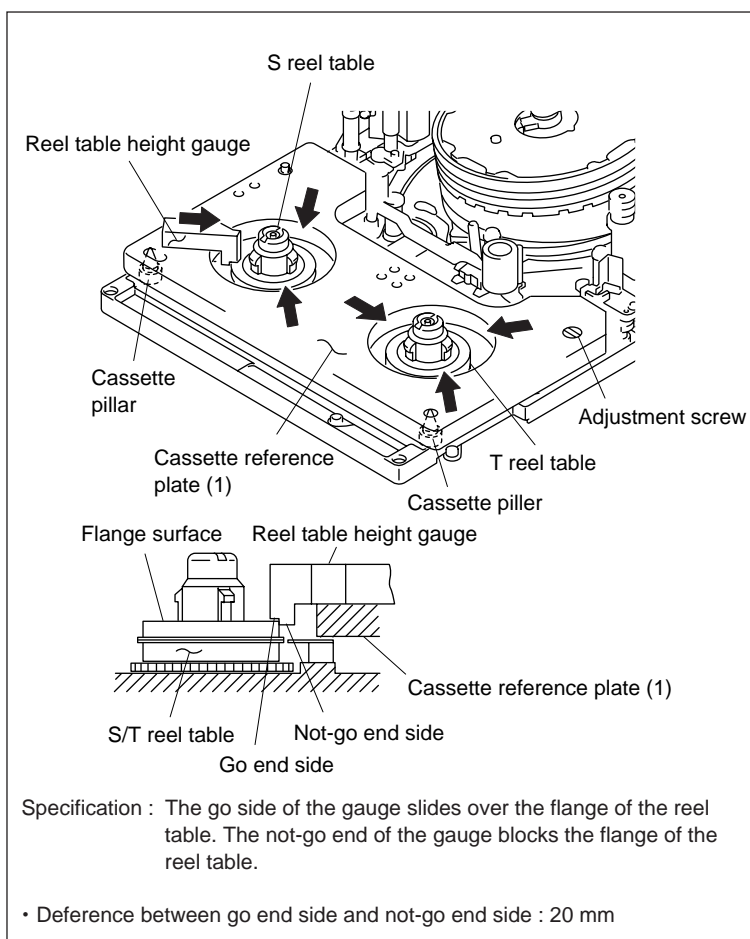
Put the reel table in the reel shaft while releasing the soft brake by finger.

### 5. Reel Table Height Adjustment

- (1) Put the cassette reference plate (1) onto the two cassette pillar as shown in the figure. Turn the adjustment screw on the cassette reference plate (1) so that cassette reference plate is not moved.
- (2) Move the reel table height gauge on the flange surface of the reel tables every 120 degrees and check that the specification is met.
- (3) If the specification is not meet, increase or decrease the number of the poly washers at the bottom of the reel table.

#### Note

If the height of the reel table is lower than the specification, put the poly washer (s) at the top of the reel in the bottom of it and re-adjust.



## 6. Reel Table Installation (2)

### S Reel table installation

- (1) Put the remaining poly washer (s) in the step 5 to the S reel shaft.
- (2) Attach the S reel table using the new stop washer 1.2.
- (3) Move the S reel table in the vertical direction and check that it moves a little. If does not move, remove the one poly washer at the top of the S reel table.
- (4) Attach the brake band to the tension regulator arm using the new stop washer 1.2.
- (5) Attach the band holder.

#### Note

Take care the references for installation in the figure.

### T reel table installation

- (1) Put the remaining poly washer (s) in the step 5 to the T reel shaft.
- (2) Attach the T reel table using the new stop washer 1.2.
- (3) Move the T reel table in the vertical direction and check that it moves a little. If does not move, remove the one poly washer at the top of the T reel table.

## 7. Operation Check

Turn lightly the reel table while releasing the soft brake by finger. Check that the reel table and the idler rotate freely.

## Adjustments After Replacement

### 8. FWD Back Tension Adjustment

(Refer to section 4-3-2.)

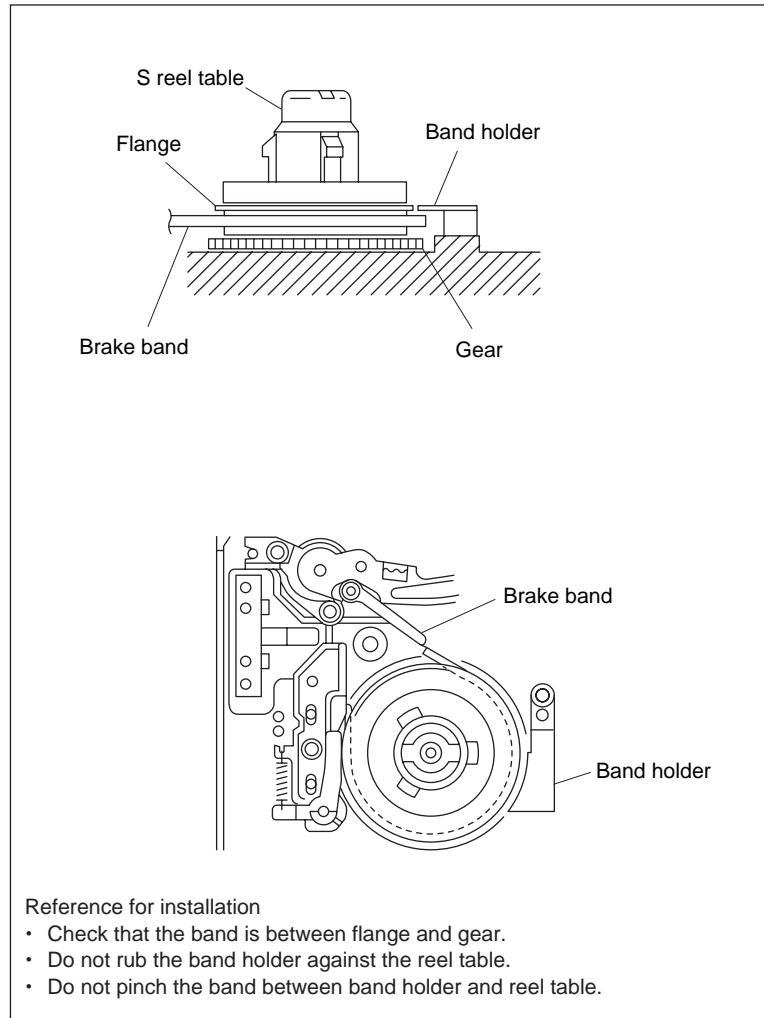
Only when replacing the S reel table

### 9. Brake Torque Check

(Refer to section 4-3-3.)

### 10. Tape Running Adjustment

(Refer to section 5-1.)





## 4-2-17. Pinch Arm Assembly Replacement

### Overviews

| Replacement                       |
|-----------------------------------|
| Pinch Arm Assembly Removal        |
| Installing Shafts Cleaning        |
| Applying Oil to Installing Shafts |
| Pinch Arm Assembly Installation   |
| Pinch Roller Cleaning             |
| Adjustment after replacement      |
| Tape Running Adjustment           |

### Note

Replacement of pinch arm assembly requires two new stop washers and the E-ring. When replacing the real table, prepare two new stop washers and the E-ring.

Stop washer 1.2 : 3-726-829-01 (2 pieces are used.)

E-ring 1.2 : 7-624-101-01 (1 piece is used.)

### Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and the outside pane. (Refer to section 1-6 of Maintenance Manual Part 1.)
4. Remove the cassette compartment. (Refer to section 1-8 Maintenance Manual Part 1.)

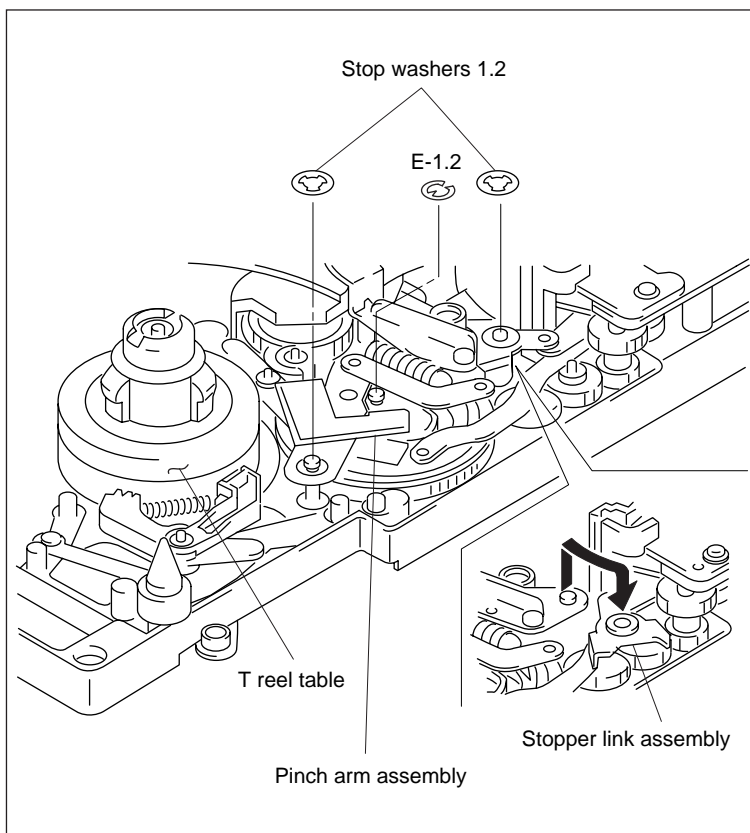
### Tools

- Stop washer fastening tool : J-6323-530-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

## Removal

### 1. Pinch Arm Assembly Removal

- (1) Remove the three stop washers 1.2 and the E-ring using a pair of the tweezers (or equivalent).
- (2) Turn and lift out the stopper link assembly in the direction of the arrow as shown in the figure.



- (3) Lift up the pinch arm assembly 2 to 3 mm.  
Remove the torsion spring from the groove of the shaft (a) while moving the pinch arm assembly toward the capstan.
- (4) Lift just above and remove the pinch arm assembly.

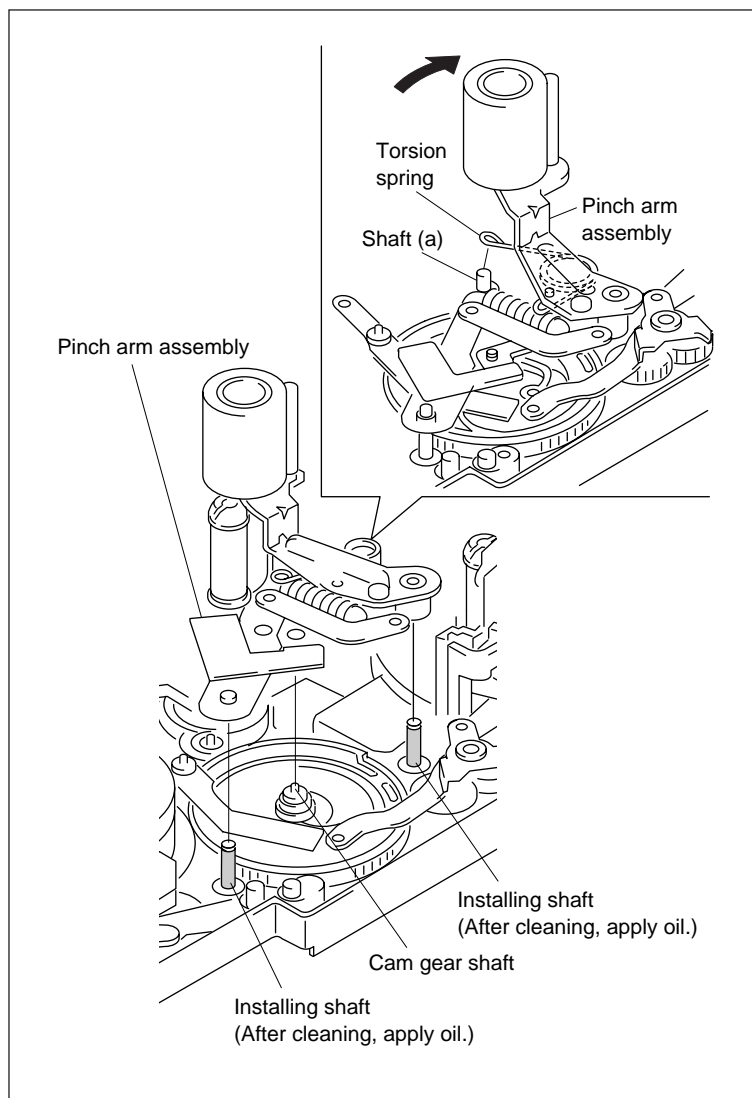
## Installation

### 2. Installing Shafts Cleaning

Clean the two installing shafts using a cleaning cloth moistened with cleaning fluid.

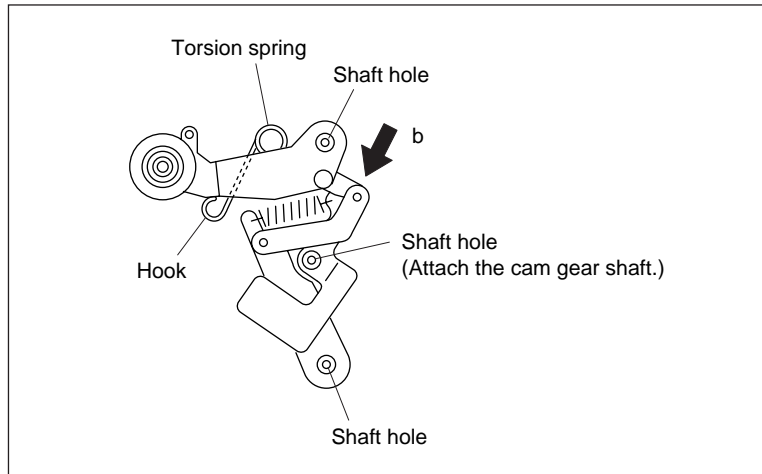
### 3. Applying Oil to Installing Shafts

Apply 1/2 drop of Sony oil to the two installing shafts.



#### 4. Pinch Arm Assembly Installation

- (1) Take the form of the pinch arm assembly as shown in the figure.



- (2) Put the two installing shafts of the mechanical chassis assembly in the two holes on the pinch arm assembly 2 to 3 mm.

**Note**

Move the coil portion of the torsion spring from the shaft (a) to the capstan motor side.

- (3) Put the hook of the torsion spring in the shaft (a) while holding the pinch arm so as not to rotate the direction of the capstan.
- (4) While pressing the portion (b) to the direction of the arrow shown in the figure, press the pinch arm assembly toward the chassis and attach the pinch arm assembly to the two installing shafts and the cam gear shaft.
- (5) Put the stopper link assembly in the installing shaft so as to hold the pinch arm.
- (6) Attach the pinch arm assembly using the two stop washers 1.2 and the E-ring.

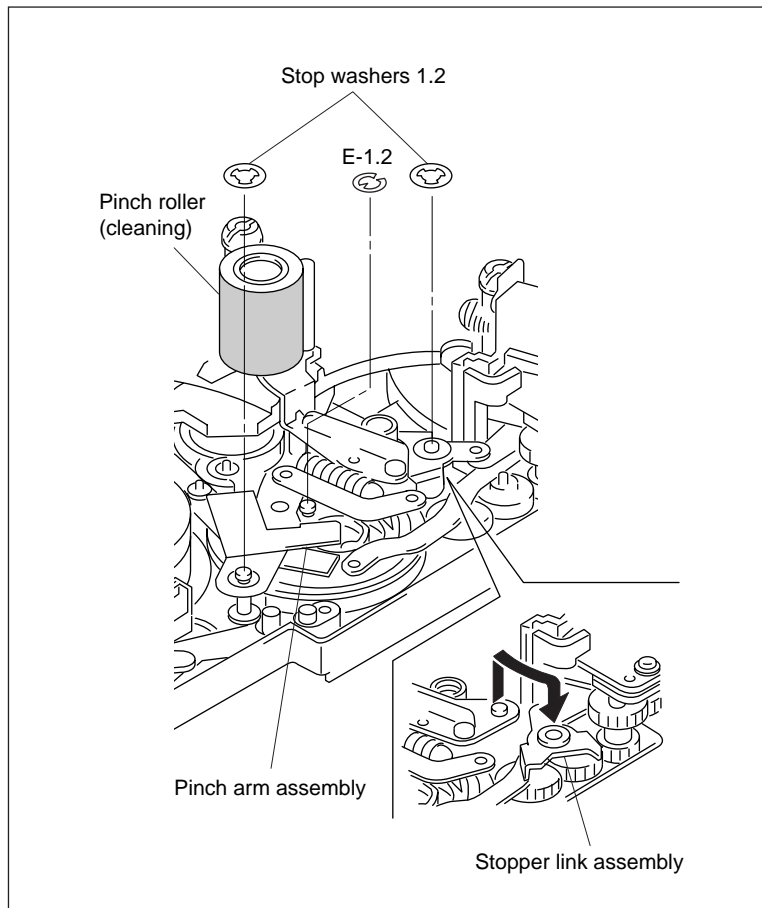
#### 5. Pinch Eoller Cleaning

Clean the surface of the pinch roller using a cleaning cloth moistened with cleaning fluid after attaching.

#### Adjustment After Replacement

#### 6. Tape Running Adjustment

(Refer to section 5-1.)



## 4-2-18. Sensor (A) Detection Pin Replacement

### Overviews

| Replacement                   |
|-------------------------------|
| Sensor Cover (A) Removal      |
| Detection Pins Installation   |
| Sensor Cover (A) Installation |
| Operation Check               |

### Preparations

1. Turn the power off.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

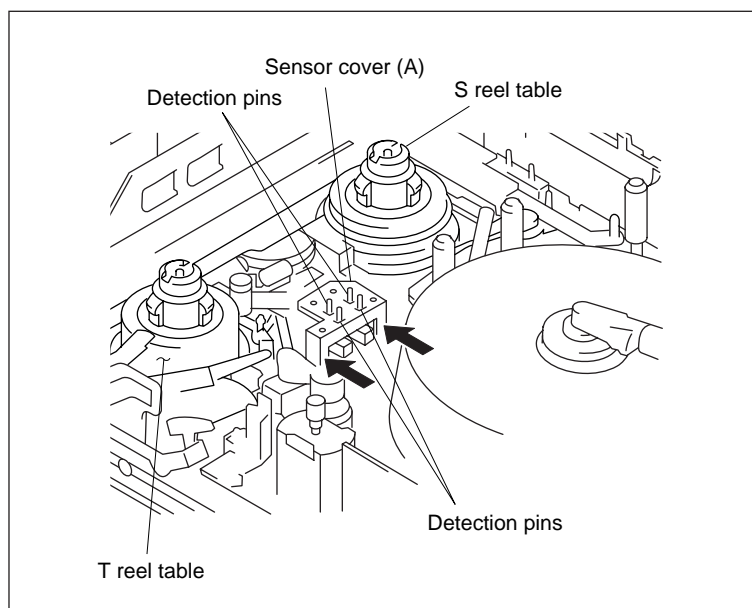
### Notes

- The detection pins for the sensor cover (A) can be replaced when the cassette compartment is attached to the unit.
- If removing the cassette guide, the replacement will be easy.

### Removal

#### 1. Sensor Cover (A) Removal

While holding the position shown in the figure using a pair of tweezers (or equivalent), remove the sensor cover (A) in the direction of the top. In this way the detection pins are removed.



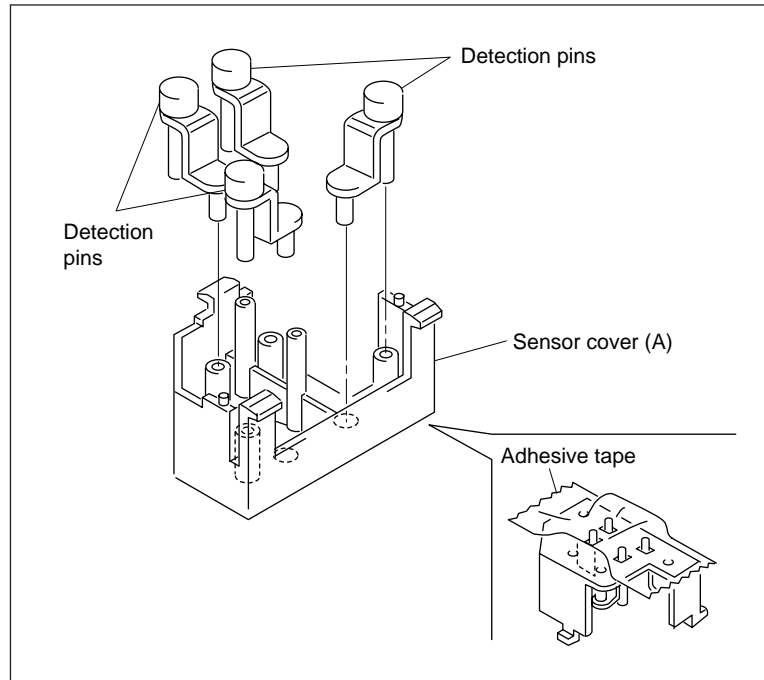
## Installation

### 2. Detection Pins Installation

Attach the detection pins to the sensor cover (A) in the direction of the arrow shown in the figure.

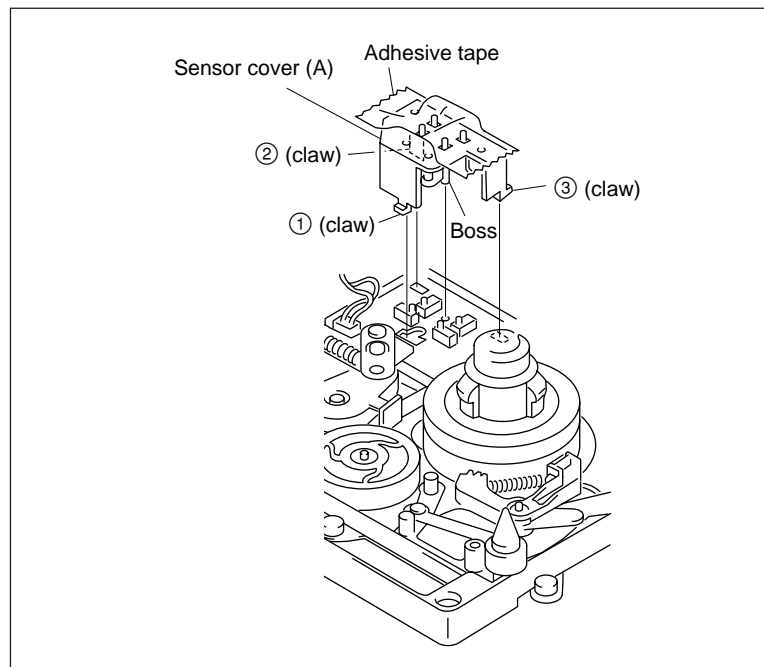
#### Note

When attaching the sensor cover (A), to prevent from the falling, it recommends that the adhesive tape is put on the position shown in the figure. After carrying out step 3, peel off and check that the adhesive tape is not put on the outer circumference of the detection pins.



### 3. Sensor Cover (A) Installation

Put the one boss and the three hooks of the sensor cover (A) in the four holes on the SE-210 board in the sequence of the figure and attach them.



### 4. Operation Check

Check that the detection pins move freely in the direction of the vertical and return it back into the position.

## 4-2-19. Sensor (B) Detection Pin Replacement

### Overviews

| Replacement                   |
|-------------------------------|
| Sensor Cover (B) Removal      |
| Detection Pins Installation   |
| Sensor Cover (B) Installation |
| Operation Check               |

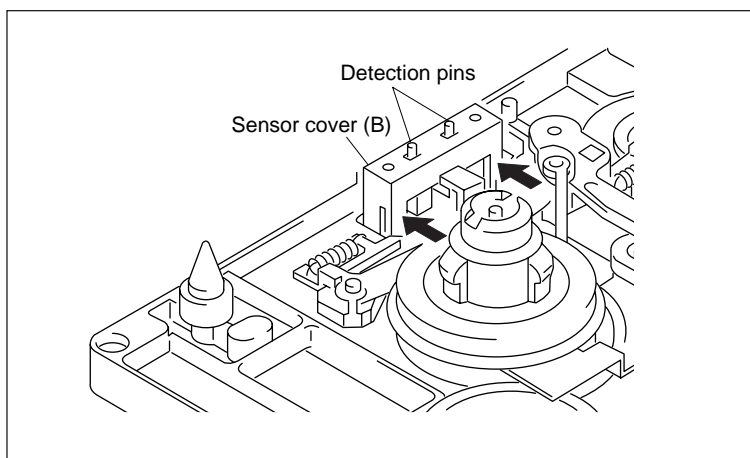
### Preparations

1. Turn the power off.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)
3. Remove the cassette compartment.

### Removal

#### 1. Sensor Cover (B) Removal

While holding the position shown in the figure using a pair of tweezers (or equivalent), remove the sensor cover (B). In this way the detection pins are removed.



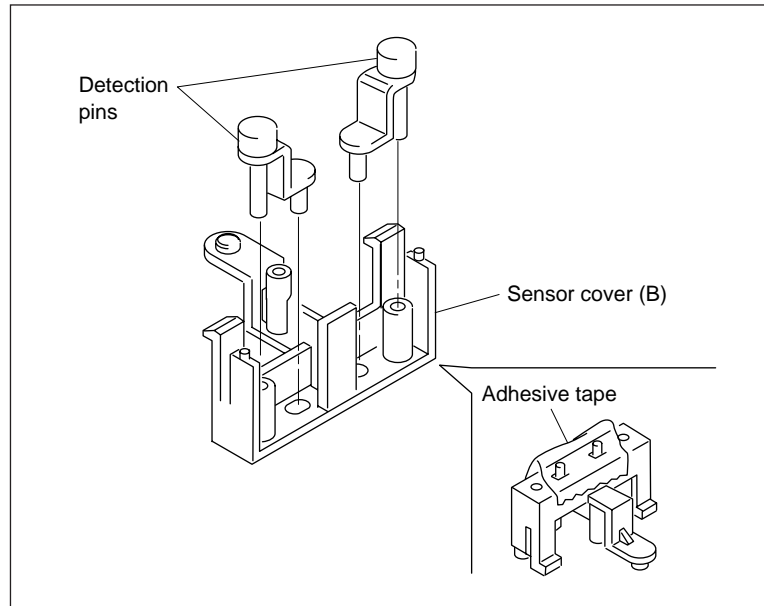
## Installation

### 2. Detection Pins Installation

Attach the detection pins to the sensor cover (B) in the direction shown in the figure.

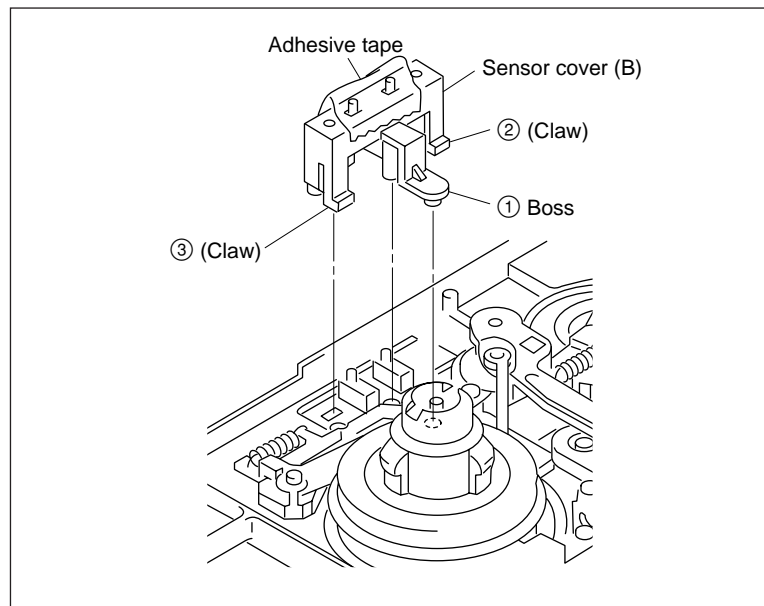
#### Note

When attaching the sensor cover (B), to prevent from the falling, it recommends that the adhesive tape is put on the position shown in the figure. After carrying out step 3, peel off and check that the adhesive tape is not put on the outer circumference of the detection pins.



### 3. Sensor Cover (B) Installation

Put the two bosses and the two hooks of the sensor cover (B) in the four holes on the SE-210 board in the sequence of the figure and attach.



### 4. Operation Check

Check that the detection pins move freely in the direction of vertical and return it back into the position.



## 4-2-20. Tension Regulator Arm Assembly Replacement

### Overviews

| Replacement                                     |
|---|
| Brake Band Removal                              |
| Tension Regulator Arm Assembly Removal          |
| Tension Regulator Arm Assembly Installation     |
| Brake Band Installation                         |
| Tension Regulator (S4) Guide Cleaning           |
| Adjustments after replacement                   |
| Tension Regulator Operating Position Adjustment |
| FWD Back tension Adjustment                     |
| Tape Running Adjustment                         |

### Note

Replacement of tension regulator arm assembly requires the new stop washer. When replacing the tension regulator arm assembly, prepare a new stop washer.

Stop washer 1.2 : 3-726-829-01 (1 piece is used.)

### Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

### Tools

- FWD back tension measurement cassette tape : J-6323-890-A
- Stop washer fastening tool : J-6323-530-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

## Removal

### 1. Brake Band Removal

- (1) Remove the stop washer on the tension regulator arm using a pair of tweezers (or equivalent).

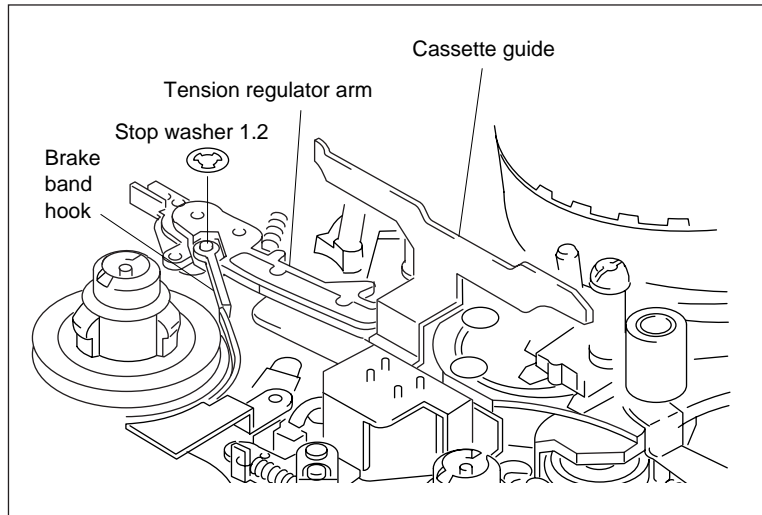
**Note**

When removing, do not press the excessive force to the tension regulator arm.

- (2) Remove the hook of the brake band from the shaft of the tension regulator arm.

**Note**

Do not bend the brake band. Do not put the oil onto the felt surface.



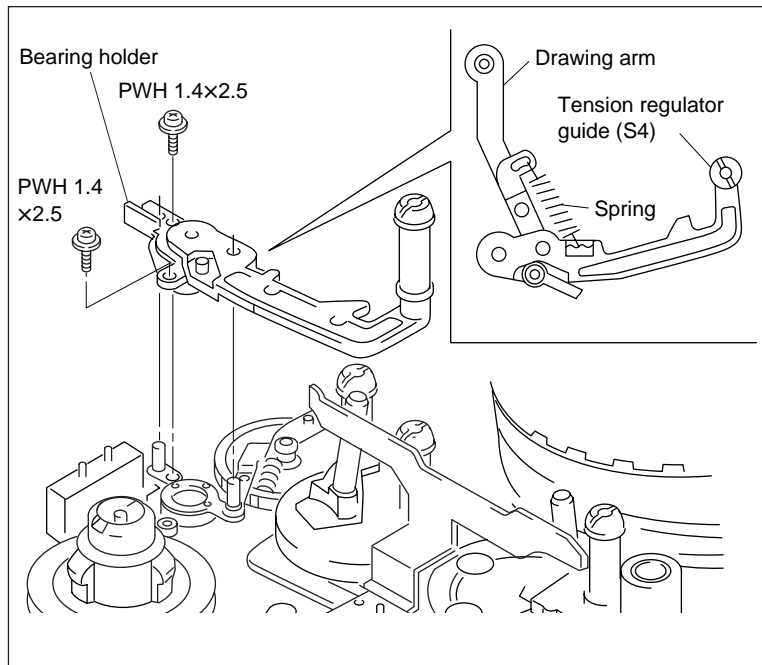
### 2. Tension Regulator Arm Assembly Removal

- (1) Remove the hook of the spring at the tension regulator arm side shown in the figure.

**Note**

Keep the positions of the spring that hooked to the drawing arm and tension regulator arm in mind.

- (2) Remove the two screws of the bearing holder and the tension regulator arm assembly.



---

## Installation

### 3. Tension Regulator Arm Assembly Installation

- (1) Attach the tension regulator arm assembly using the two screws.
- (2) Re-hook the removed spring in the step 2 (1) to its original positions.

### 4. Brake Band Installation

- (1) Put the hook of the brake band in the shaft of the tension regulator arm.
- (2) Attach the stop washer while supporting the arm by finger.

|             |
|-------------|
| <b>Note</b> |
|-------------|

When attaching, do not press the excessive force to the tension regulator arm.

### 5. Tension Regulator (S4) Guide Cleaning

Clean the tension regulator (S4) guide using a cleaning cloth moistened with cleaning fluid.  
After cleaning, be sure to wipe with a dry cleaning cloth.

---

## Adjustments After Replacement

### 6. Tension Regulator Operating Position Adjustment

(Refer to section 4-3-1.)

### 7. FWD Back Tension Adjustment

(Refer to section 4-3-2.)

### 8. Tape Running Adjustment

(Refer to section 5-1.)

## 4-2-21. Replacement of the Component Parts of the Threading Link Block

### Overviews

| Replacement   |
|---|
| Cassette Guide Removal                              |
| Video Head Cleaner Removal                          |
| Brush Assembly Connector Disconnection              |
| Drum Assembly Removal                               |
| Band Holder Removal                                 |
| Tension Regulator Arm Assembly Removal              |
| Pinch Arm Assembly Removal                          |
| Drawing Arm Removal                                 |
| Driving Gear Removal                                |
| Catcher S Removal                                   |
| Threading Link Assembly Removal                     |
| Slider Removal                                      |
| Threading Gear Assembly Removal                     |
| Threading Gear Assembly Installation                |
| Slider Installation                                 |
| Threading Link Assembly Installation                |
| Catcher S Installation                              |
| Driving Gear Installation                           |
| Drawing Arm Installation                            |
| Pinch Arm Assembly Installation                     |
| Tension Regulator Arm Assembly Installation         |
| Band Holder Installation                            |
| Drum Assembly Installation                          |
| Brush Assembly Connector Connection                 |
| Video Head cleaner Installation                     |
| Cassette Guide Installation                         |
| Cleaning of the Head and the Tape Tuning Surface    |
| Adjustments after replacement                       |
| Tension Regulator Arm Operating Position Adjustment |
| FWD Back Tension Adjustment                         |
| Tape Running Adjustment                             |

**Notes**

- When attaching the pinch arm assembly, S and T sliders, prepare the new E-ring  
E-ring 1.2 : 7-624-101-01 (Use the one E-ring for the one part replacement.)
- When attaching the pinch arm assembly and the driving gear, prepare the new four stop washers.  
Stop washer 1.2 : 3-726-829-01 (4 pieces are used.)

**Preparations**

1. Check that the unit is in the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and the outside pane. (Refer to section 1-6 of Maintenance Manual Part 1.)
4. Remove the cassette compartment. (Refer to section 1-8 of Maintenance Manual Part 1.)

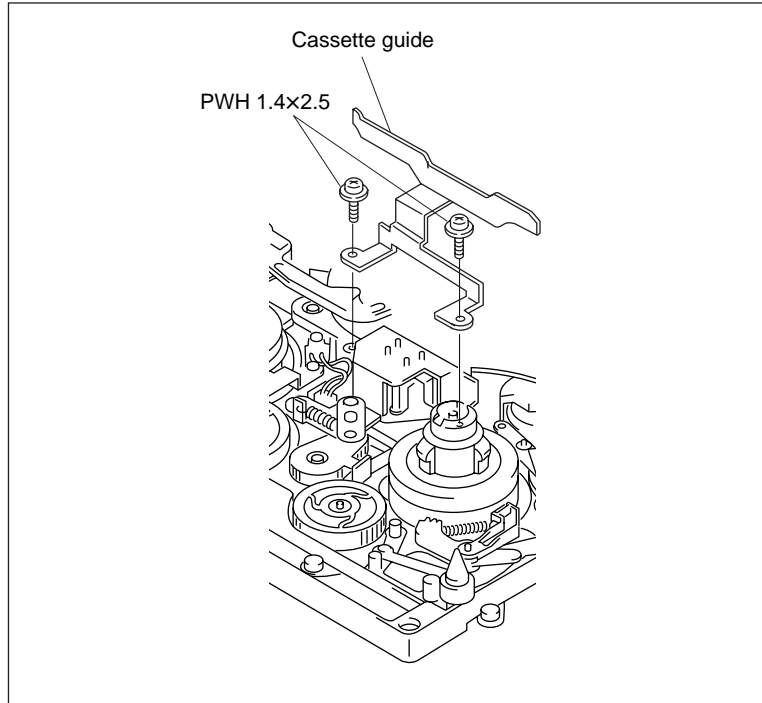
**Tools**

- FWD back tension measurement cassette tape : J-6323-890-A
- Stop washer fastening tool : J-6323-530-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

## Removal

### 1. Cassette Guide Removal

Remove the two screws and the cassette guide.



### 2. Video Head Cleaner Removal

- (1) Turn the manual eject assembly clockwise so that the HC roller of the video head cleaner releases from the drum.
- (2) Loosen the screw while holding the video head cleaner bracket using a pair of tweezers and remove the video head cleaner assembly.

#### Note

The screw can not remove due to the drop-safe.

### 3. Disconnection Brush Assembly Connector

Disconnect the connector on the brush assembly board.

### 4. Drum Assembly Removal

- (1) Remove the three screws of the drum assembly.
- (2) Lift just above the drum assembly and disconnect the three connectors (CN1, CN2 and CN3) on the lower board of the drum.

#### Note

When removing, take care not to damage the CTL head, CUE/TC head and the peripheral tape guides.

### 5. Band Holder Removal

Remove the screw and the band drop-safe.

## 6. Tension Regulator Arm Assembly Removal

Remove the tension regulator arm assembly.  
(Refer to section 4-2-20.)

## 7. Pinch Arm Assembly Removal

Remove the pinch arm assembly.  
(Refer to section 4-2-17.)

## 8. Drawing Arm Removal

Remove the stop washer 1.2 and the drawing arm.

## 9. Driving Gear Removal

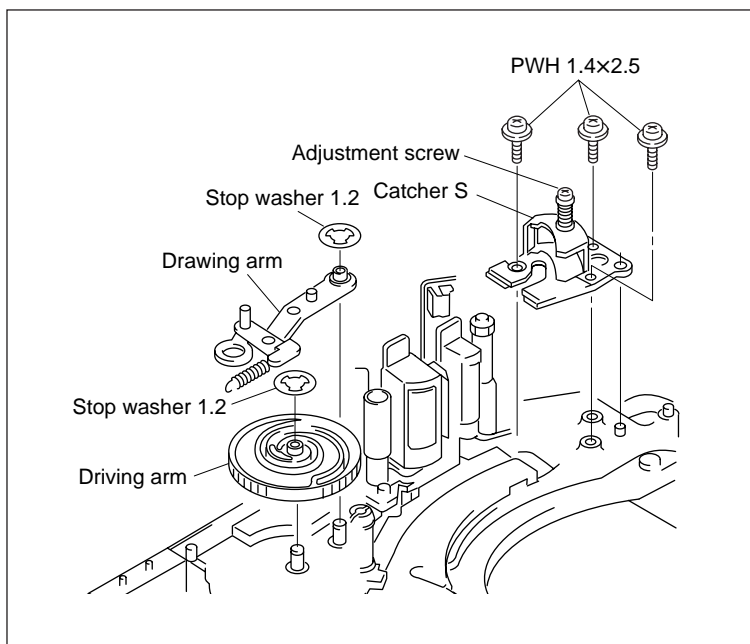
Remove the stop washer 1.2 and the driving gear.

## 10. Catcher S Removal

Remove the three screws and the catcher S.

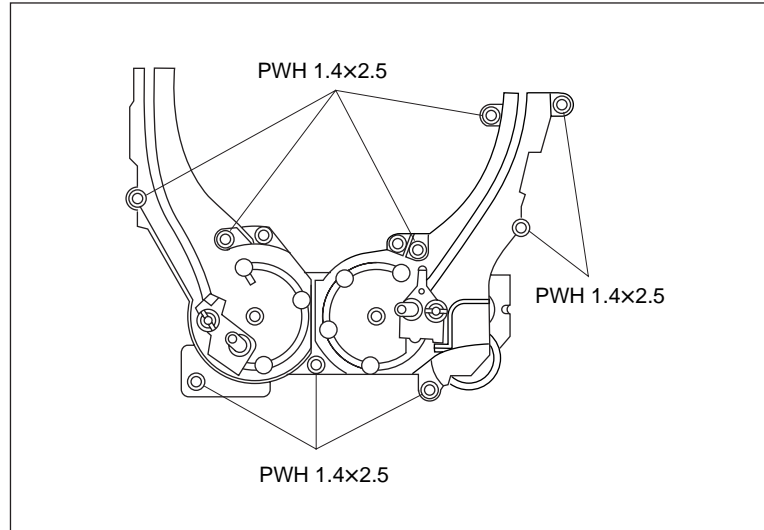
### Note

Never turn and remove the adjusting screw of the catcher S.



## 11. Threading Link Assembly Removal

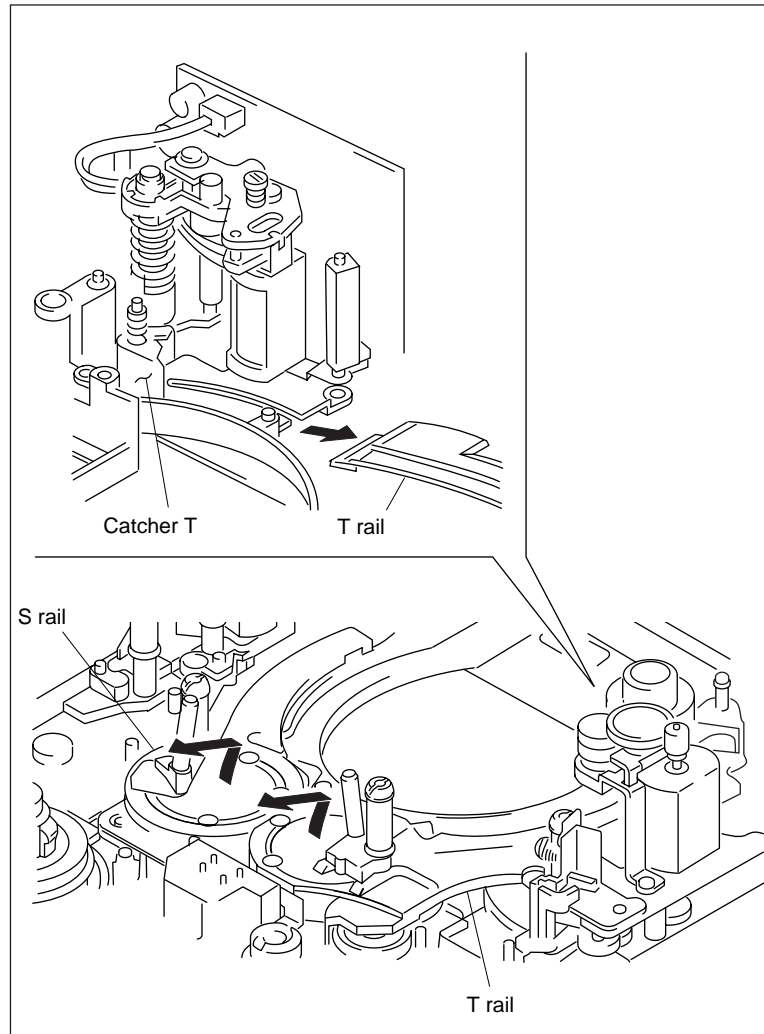
- (1) Remove the nine screws shown in the figure.



- (2) Because the tip of the T rail is installed under the catcher T, remove the threading link assembly while inclining.

**Note**

Do not touch the rail against the stationary head.





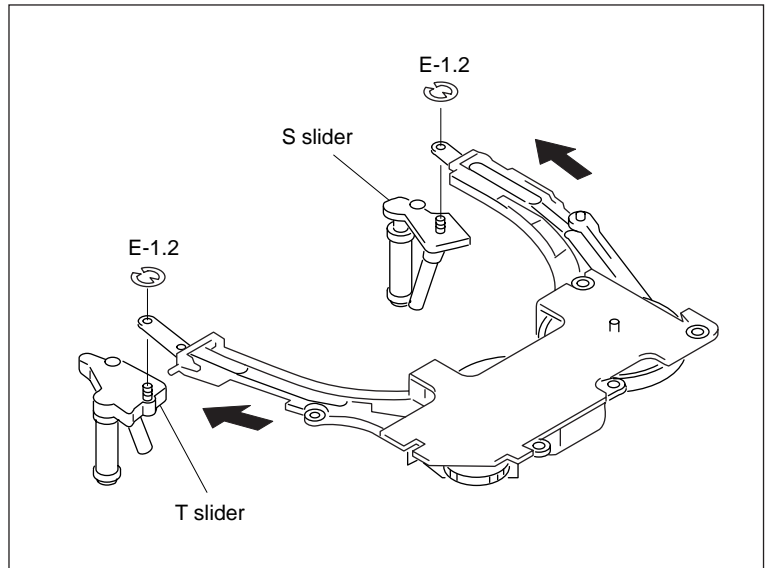
## 12. Slider Removal

(The procedures for removing the S side slider are the same as for removing the T side one.)

- (1) Pull out the slider and remove the E-ring from the back.
- (2) Pull out the slider from the end of the rail.

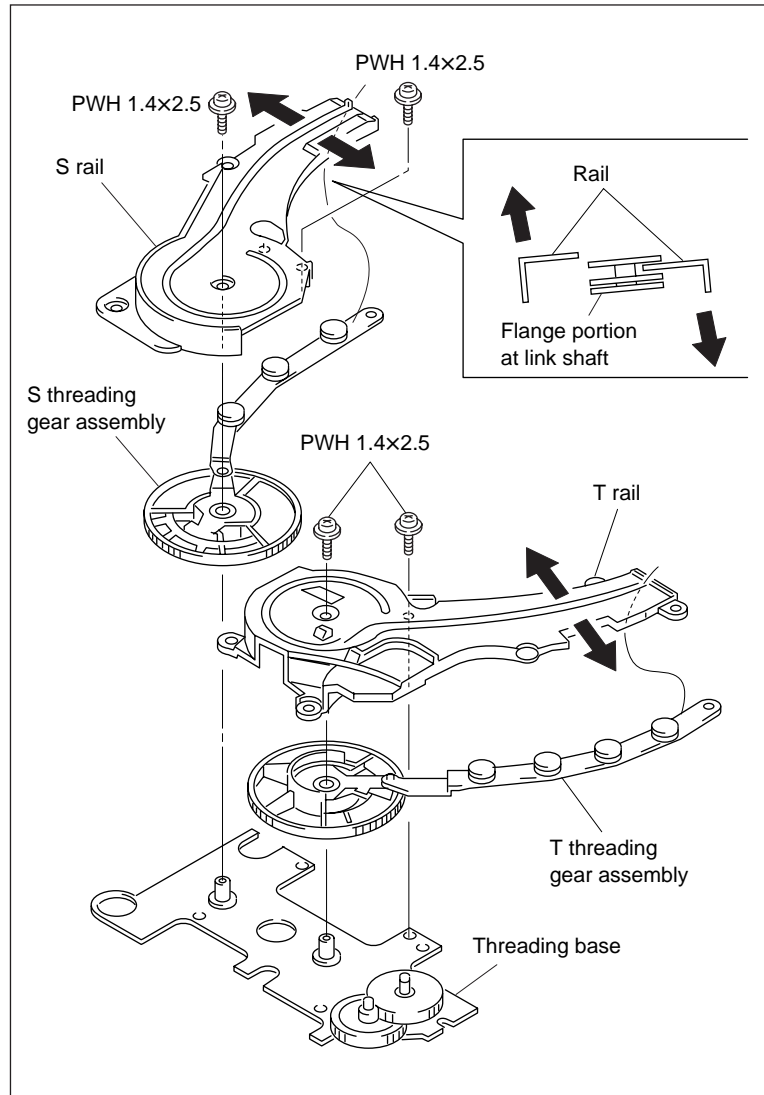
**Note**

Handle the removed slider with care. Do not scratch and deform the guides and the roller block.



### 13. Threading Gear Assembly Removal (The procedures for removing the S side threading gear are the same as for removing the T side one).

- (1) Remove the flange portion at the link shaft of the threading gear assembly while opening the rail.
- (2) Remove the two screws, and remove the rail and the threading gear assembly from the threading gear assembly from the threading base.

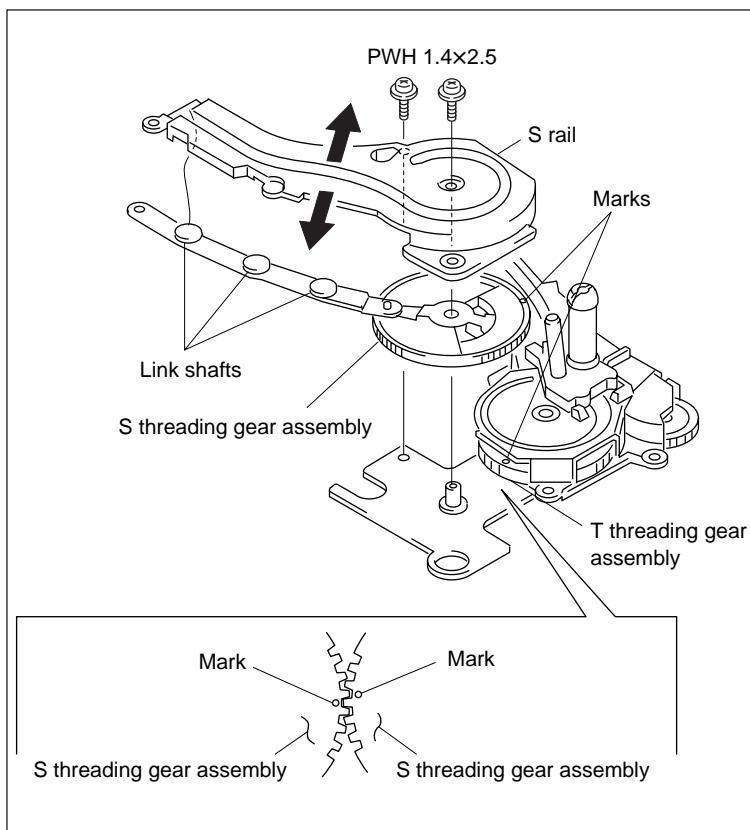


## Installation

### 14. Threading Gear Assembly Installation

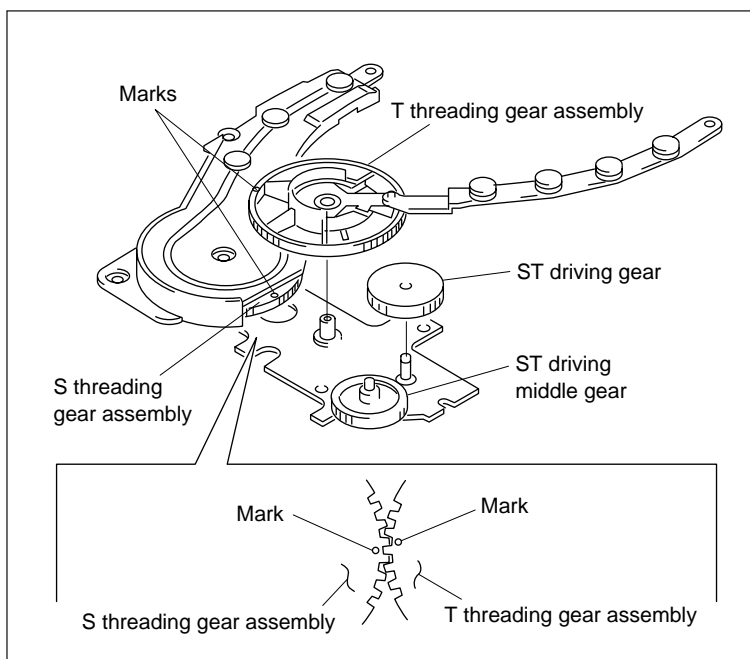
#### S threading gear assembly installation

- (1) Attach the S threading gear assembly to the threading base while aligning the mark of the S threading gear as shown in the figure.
- (2) Attach the rail using the two screws.
- (3) Put the flange portion are the link shaft of the S threading gear assembly to the rail while opening the groove of the rail.

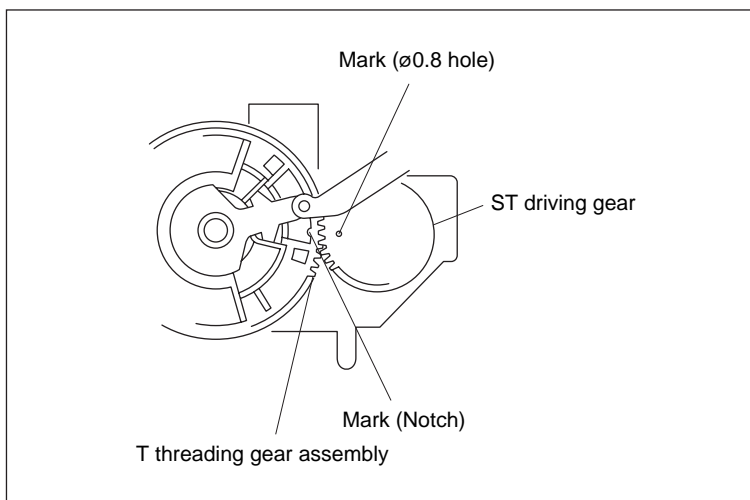


#### T threading gear assembly installation

- (1) Attach the T threading gear assembly to the threading base while aligning the mark of the T threading gear as shown in the figure.



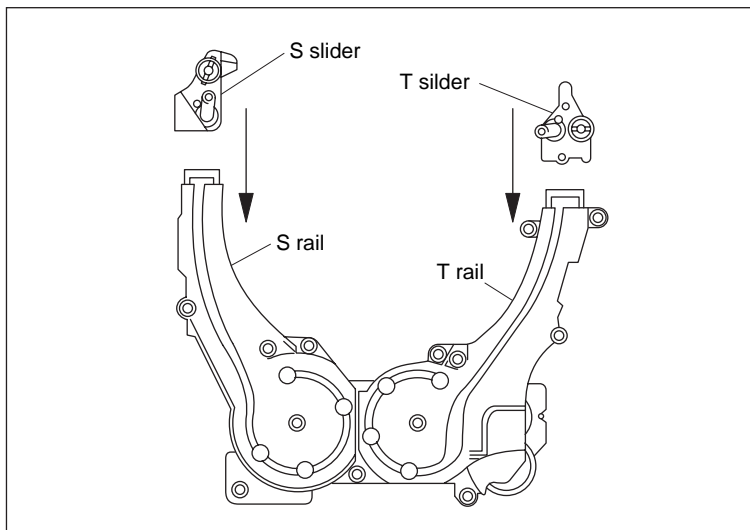
- (2) Align the mark (notch) of the T threading gear with the mark (hole) of the ST driving gear as shown in the figure.
- (3) Attach the rail using the two screws.
- (4) Put the flange portion at the link shaft of the T threading gear assembly in the rail while opening the groove of the rail.



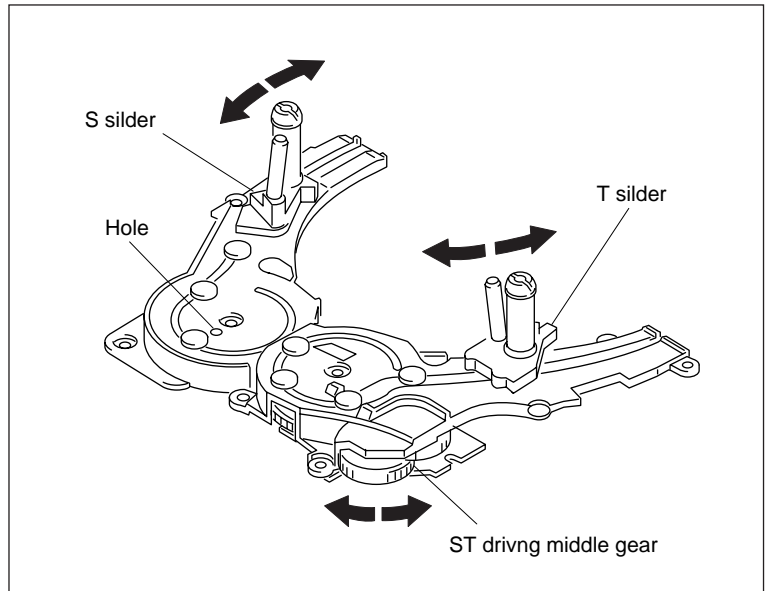
## 15. Slider Installation

**(The procedures for attaching the S slider are the same as for attaching the T one.)**

- (1) Put the slider in the rail in the direction of the arrow.
- (2) Put the installing shaft of the slider in the installing hole of the link using the new E-ring.

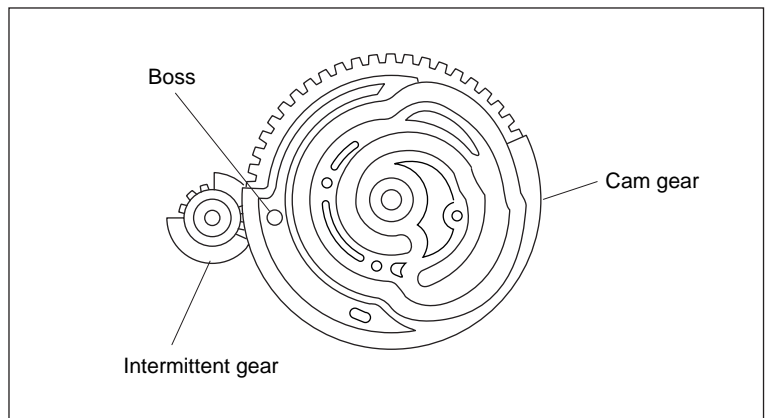


- (3) Turn the ST driving middle gear by finger and check that the slider moves smoothly.



## 16. Threading Link Assembly Installation

- (1) Put the screw (2×10) in the hole shown in the figure.
- (2) Turn the manual eject gear clockwise so that the cam gear is at the position shown figure.

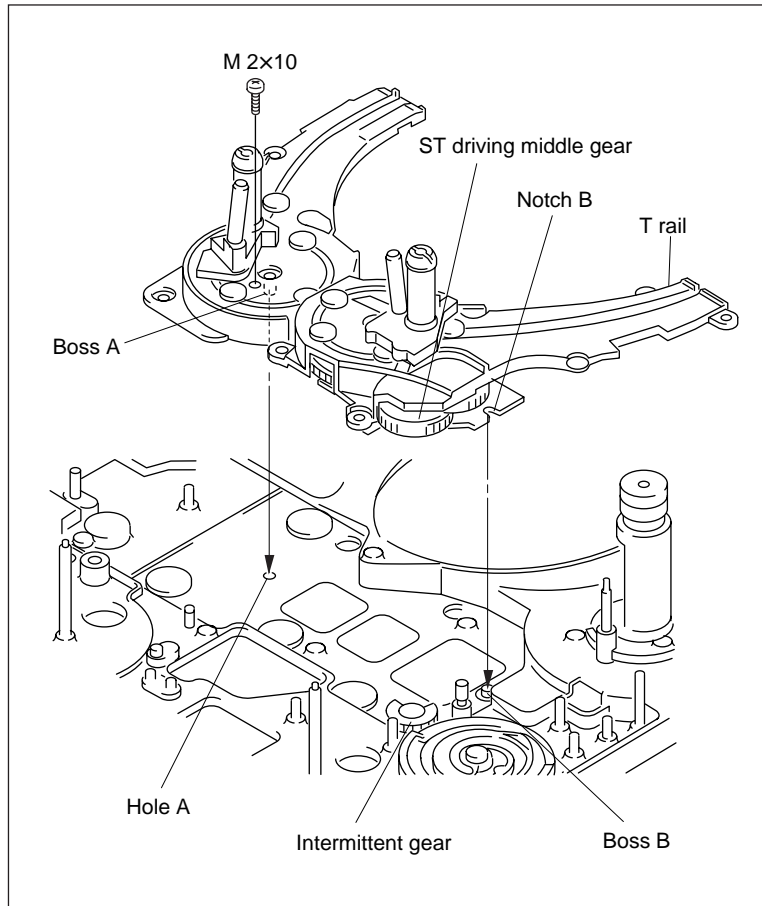


- (3) Put the tip of the T rail under the catcher T.
- (4) Align the boss (A) and the hole, and the notch (B) and the boss as shown in the figure. Attach the threading link assembly to the mechanical chassis.
- (5) If the ST driving middle gear does not engage with the intermittent gear, turn the manual eject gear clockwise till they engage. (The intermittent gear is turned together with the manual eject gear.)
- (6) Tighten the nine screws.

**Note**

Do not scratch the stationary heads by the driver.

- (7) Remove the screw (2×10) attached in the step 16 (1) from the threading link assembly.
- (8) If the intermittent gear turned in the step (5), turn the manual eject knob counterclockwise and return the cam gear to the position of the step (2).

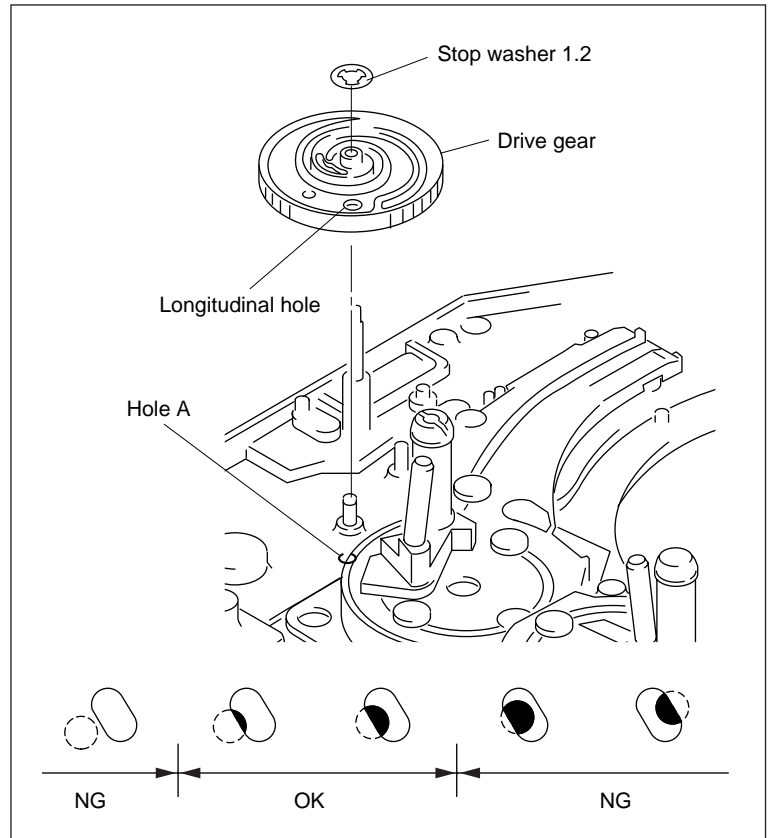


## 17. Catcher S Installation

Attach the catcher S using the three screws.

### 18. Driving Gear Installation

- (1) Align the hole of the drive gear and the hole (A) on the mechanical chassis and put the drive gear to the shaft.
- (2) Attach the drive gear using the new stop washer 1.2.



### 19. Drawing Arm Installation

Put the drawing arm to the installing shaft and attach it using the stop washer.

### 20. Pinch Arm Assembly Installation

Attach the pinch arm assembly.

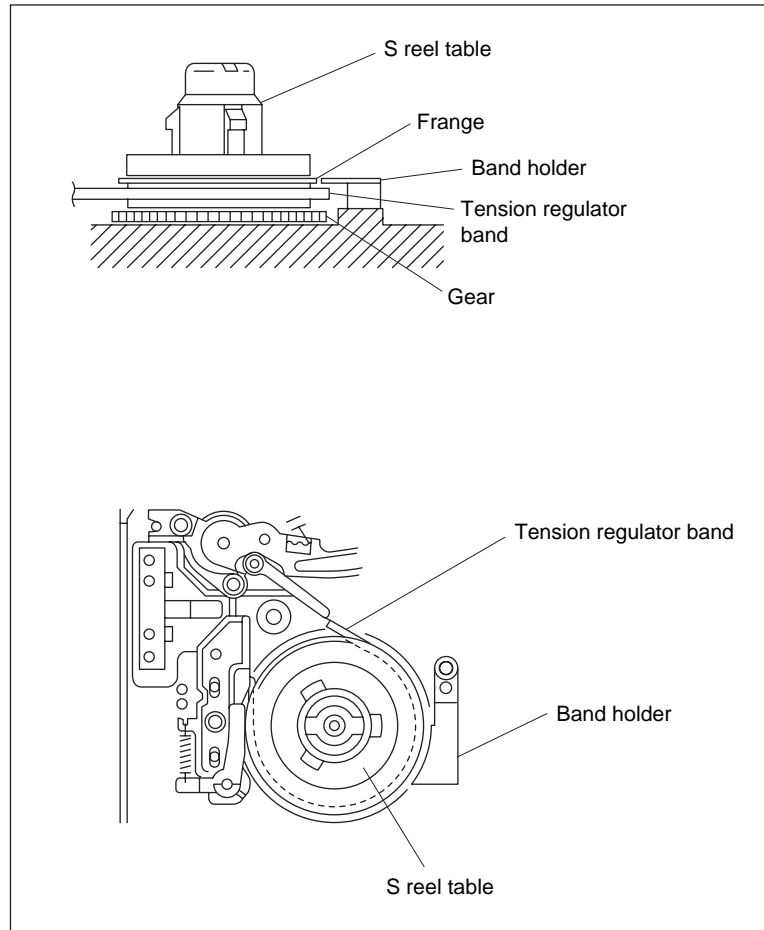
(Refer to section 4-2-17.)

## 21. Tension Regulator Arm Assembly Installation

Attach the tension regulator arm assembly.  
(Refer to section 4-2-20.)

## 22. Band Holder Installation

Attach the band stopper using one screw.



## 23. Drum Assembly Installation

- (1) Clean the contact surfaces of the drum assembly and chassis using a cleaning cloth moistened with cleaning fluid.

### Notes

- When holding the drum assembly, be sure to hold the area where video heads are not installed.
  - Take care not to touch the drum assembly against the stationary heads.
- (2) Connect the three connectors (CN1, CN2 and CN3) to the lower board of the drum.
  - (3) Put the two positioning pins of the chassis to the holes of the drum assembly.
  - (4) Move the drum assembly a little and check that the drum assembly is put in the positioning pins.
  - (5) Tighten the three screws.



**24. Connection the Brush Assembly Connector**

Connect the connector to the brush assembly board.

**25. Video Head Cleaner Installation**

Put the video head cleaner bracket of the video head cleaner onto the surface of the unit using a pair of tweezers and tighten the screw.

**26. Cassette Guide Installation**

Attach the cassette guide using the two screws.

**27. Cleaning of the Head and the Tape Running Surface**

Clean the following areas using a cleaning cloth moistened with cleaning fluid.

- Video head
- Tape running surface of the upper drum
- Tape running surface and lead of the lower drum
- All tape guides and pinch roller

**Note**

After cleaning, be sure to wipe the relevant areas using a dry cleaning cloth.

---

**Adjustments After Replacement****28. Tension Regulator Operating Position Adjustment**

(Refer to section 4-3-1.)

**29. FWD Back Tension Adjustment**

(Refer to section 4-3-2.)

**30. Tape Running Adjustment**

(Refer to section 5-1.)

4-2-22. Replacement of Loading Motor

Overviews

| Replacement                       |
|-----------------------------------|
| Manual Eject Assembly Removal     |
| Cassette Compartment Removal      |
| Gear Block Assembly Removal       |
| Motor Removal                     |
| Pinion Gear Removal               |
| Pinion Gear Installation          |
| Motor Installation                |
| Gear Block Assembly Installation  |
| Cassette Compartment Installation |

Preparations

- 1. Check that unit is in the unthreading end mode.
- 2. Turn the power off.
- 3. Remove the fron lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

Tools

- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

## Removal

### 1. Manual Eject Assembly Removal

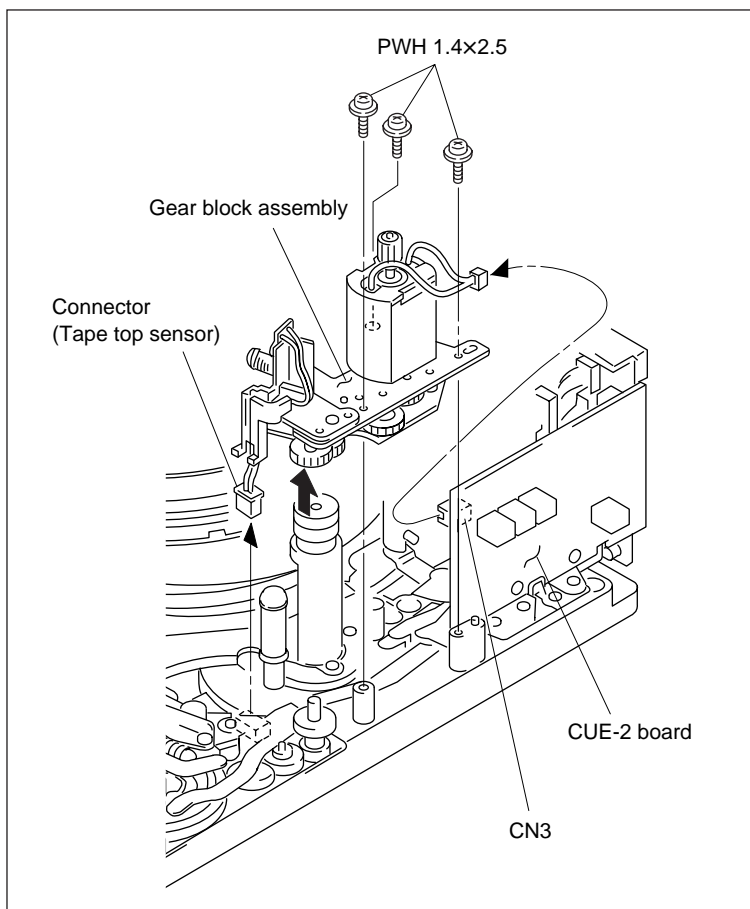
Remove the screw and the manual eject assembly. (Refer to section 4-4-1.)

### 2. Cassette Compartment Removal

Remove the three screws and the cassette compartment. (Refer to section 1-8 of Maintenance Manual Part 1.)

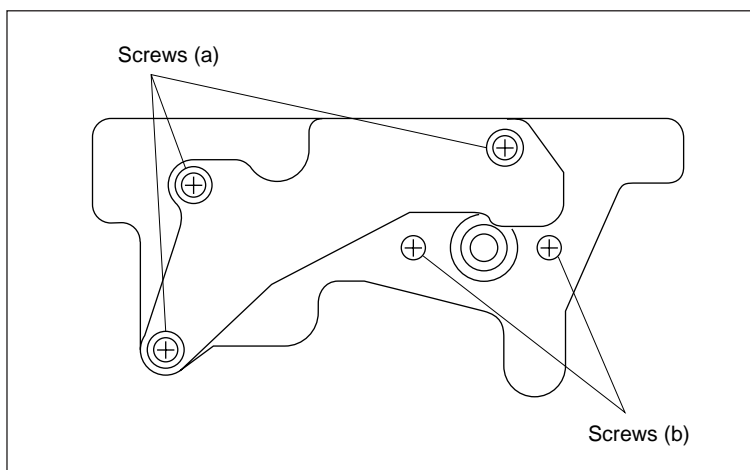
### 3. Gear Block Assembly Removal

- (1) Disconnect the connector CN3 on the CUE-2 board which attaches to the CUE head block.
- (2) Remove the three screws.
- (3) Lift up the gear block assembly and disconnect the connector of the tape top sensor from the SE-275 board. In this way the gear block assembly will remove.



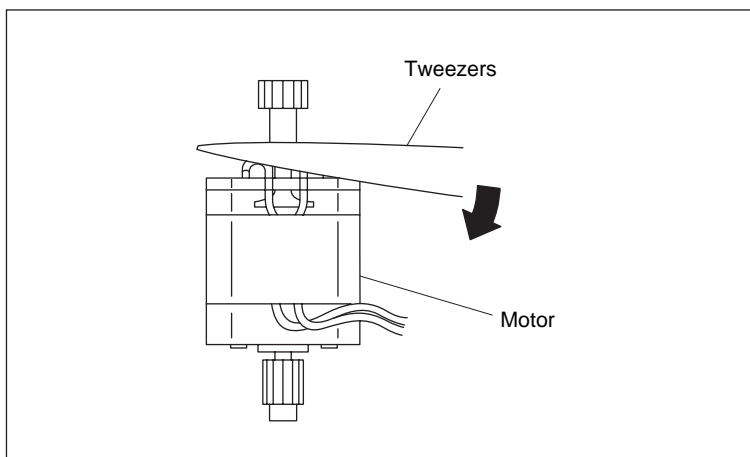
### 4. Motor Removal

Remove the two screws (b) and removing the motor.



## 5. Pinion Gear Removal

Remove the two pinion gears by pushing it out with the tip of a pair of tweezers, etc. .



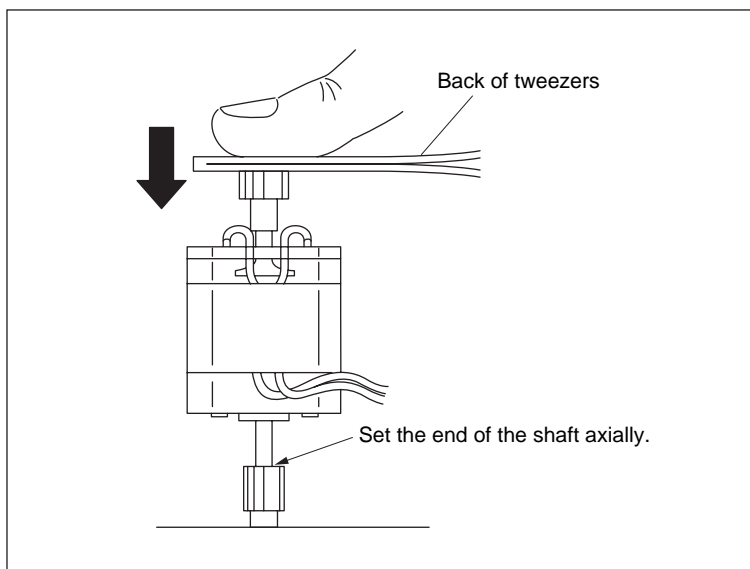
## Installation

### 6. Pinion Gear Installation

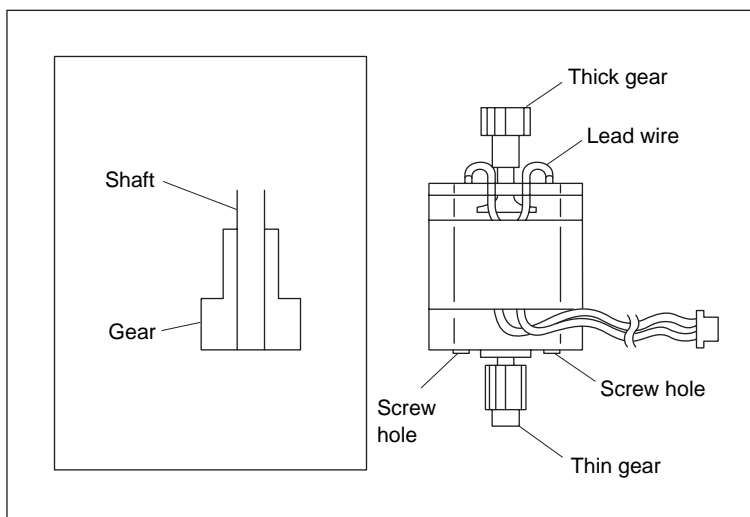
- (1) Place the pinion gears removed at step 5 on a solid and flat board and set the end of the shaft axially.

**Note**

Take note of the direction of the pinion gears.

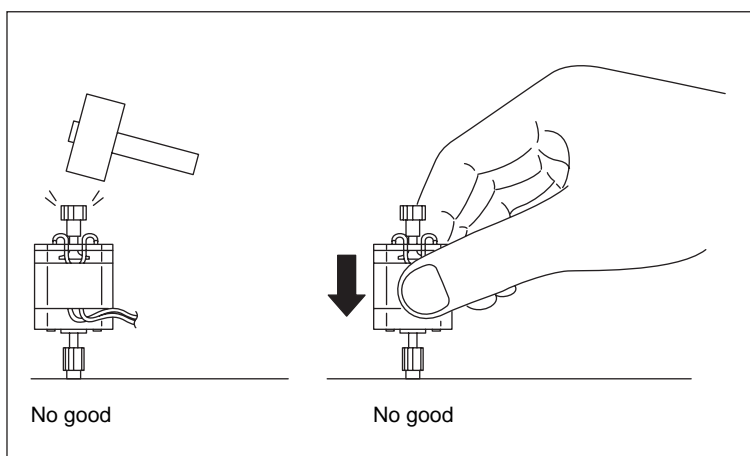


- (2) Push the other end of the shaft with the back of the tweezers until the pinion gears are completely inside.



**Note**

Do not hit the shafts with a hammer nor push in by holding the housing of the motor.



## 7. Motor Installation

Attach the motor using the two screws.

The standard tightening torque value :

$$21 \times 10^{-2} \text{ N}\cdot\text{m} \{2.1 \text{ kgf}\cdot\text{cm}\}$$

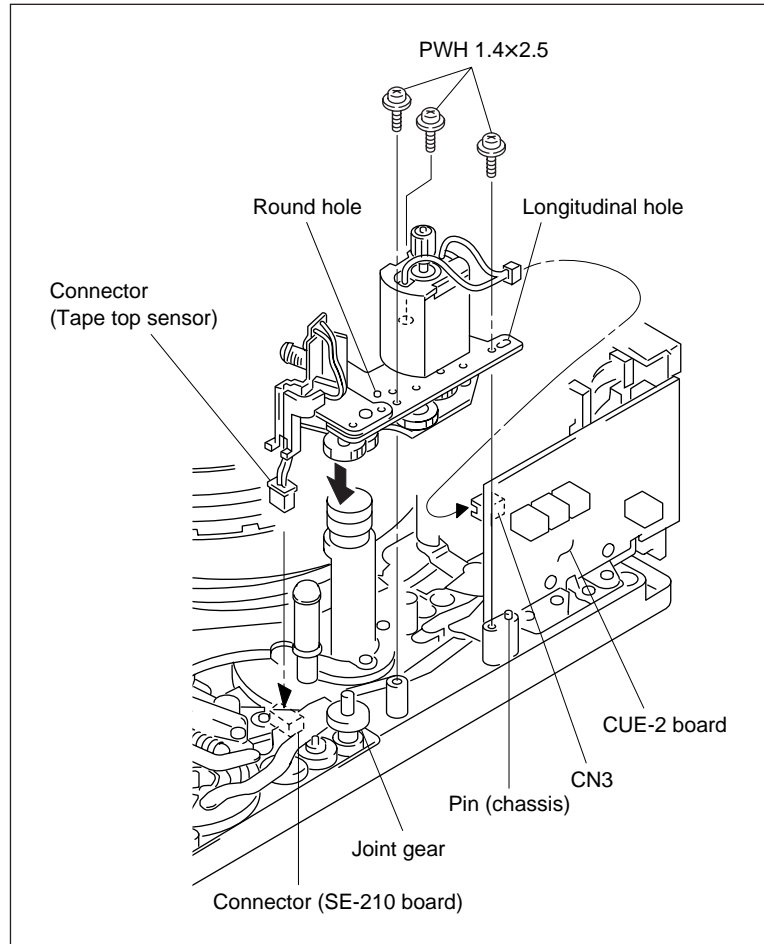
## 8. Gear Block Assembly Installation

- (1) While connecting the connector of the tape top sensor that connects to the rear block assembly to the connector on the SE-275 board which is attached to the chassis, put the pin of the chassis in the longitudinal hole of the gear block assembly and the top of the joint gear that is attached to the chassis in the round hole of the gear block assembly. Tighten the three screws.

The standard tightening torque value :

$$9 \times 10^{-2} \text{ N}\cdot\text{m} \{0.9 \text{ kgf}\cdot\text{cm}\}$$

- (2) Connect the harness connector to the connector CN3 on the CUE-2 board.



## 9. Cassette Compartment Installation

Attach the cassette compartment using the three screws. (Refer to section 1-8 of Maintenance Manual Part 1.)

The standard tightening torque value :

$$9 \times 10^{-2} \text{ N}\cdot\text{m} \{0.9 \text{ kgf}\cdot\text{cm}\}$$

## 4-2-23. Replacement of FE Head

### Overviews

| Replacement                         |
|-------------------------------------|
| Entrance Head Assembly Removal      |
| FE Head Removal                     |
| Harness Removal                     |
| Harness Soldering                   |
| FE head Installation                |
| Entrance Head Assembly Installation |
|                                     |
| Adjustment after replacement        |
| Tape Running Adjustment             |

### Preparations

1. Check the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

### Tools

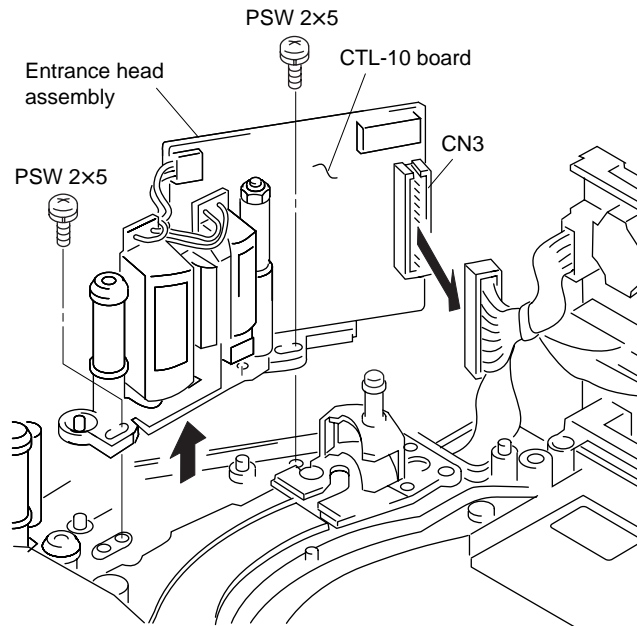
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

## Removal

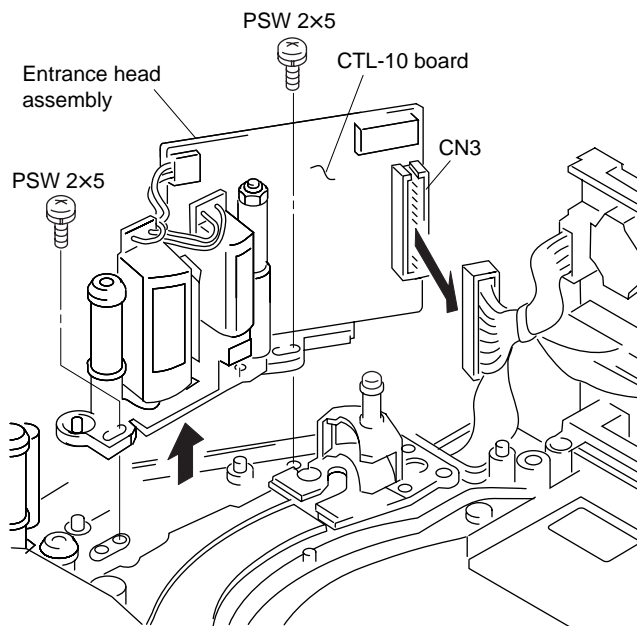
### 1. Entrance Head Assembly Removal

- (1) Remove the harness shown in the figure.
- (2) Remove the two screws and remove the entrance head assembly.

|            |                     |             |                     |
|------------|---------------------|-------------|---------------------|
| DVW-707:   | 10001 through 10055 | DVW-707P:   | 40001 through 40190 |
| DVW-709WS: | 10001 through 10125 | DVW-709WSP: | 40001 through 40255 |
| DVW-790WS: | 10001 through 10160 | DVW-790WSP: | 40001 through 40510 |



|            |                  |             |                  |
|------------|------------------|-------------|------------------|
| DVW-707:   | 10056 and higher | DVW-707P:   | 40191 and higher |
| DVW-709WS: | 10126 and higher | DVW-709WSP: | 40256 and higher |
| DVW-790WS: | 10161 and higher | DVW-790WSP: | 40511 and higher |

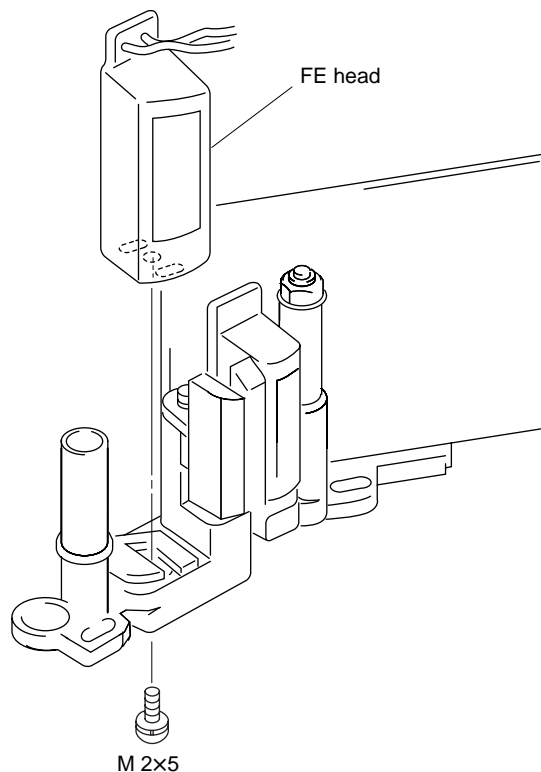




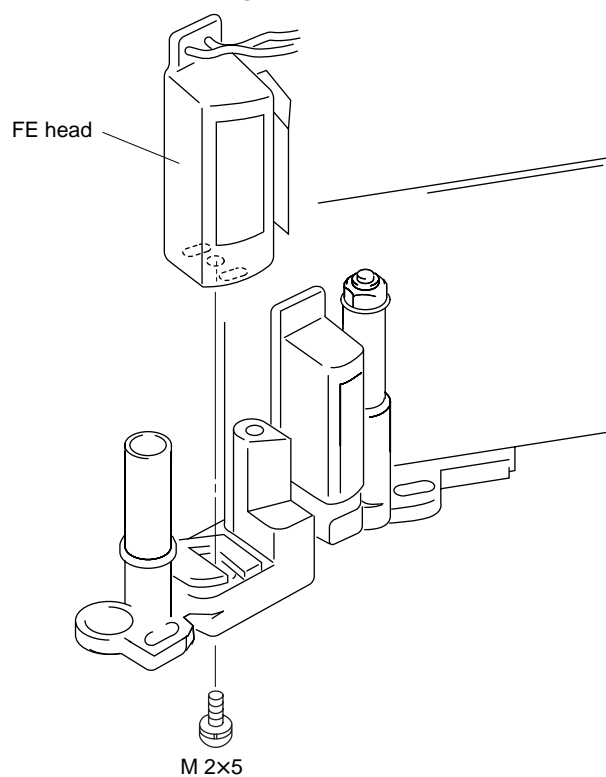
## 2. FE Head Removal

Remove the one screw and remove the FE head.

|            |                     |             |                     |
|------------|---------------------|-------------|---------------------|
| DVW-707:   | 10001 through 10055 | DVW-707P:   | 40001 through 40190 |
| DVW-709WS: | 10001 through 10125 | DVW-709WSP: | 40001 through 40255 |
| DVW-790WS: | 10001 through 10160 | DVW-790WSP: | 40001 through 40510 |



|            |                  |             |                  |
|------------|------------------|-------------|------------------|
| DVW-707:   | 10056 and higher | DVW-707P:   | 40191 and higher |
| DVW-709WS: | 10126 and higher | DVW-709WSP: | 40256 and higher |
| DVW-790WS: | 10161 and higher | DVW-790WSP: | 40511 and higher |



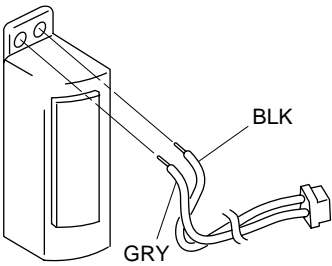
**3. Harness Removal**

Desolder and remove the harness.

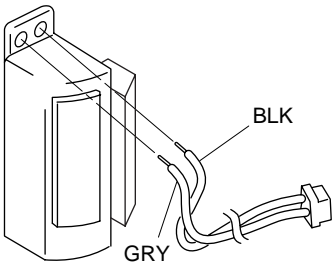
**4. Harness Soldering**

Attach the harness removed at step 3 with solder to the new FE head.

|            |                     |             |                     |
|------------|---------------------|-------------|---------------------|
| DVW-707:   | 10001 through 10055 | DVW-707P:   | 40001 through 40190 |
| DVW-709WS: | 10001 through 10125 | DVW-709WSP: | 40001 through 40255 |
| DVW-790WS: | 10001 through 10160 | DVW-790WSP: | 40001 through 40510 |



|            |                  |             |                  |
|------------|------------------|-------------|------------------|
| DVW-707:   | 10056 and higher | DVW-707P:   | 40191 and higher |
| DVW-709WS: | 10126 and higher | DVW-709WSP: | 40256 and higher |
| DVW-790WS: | 10161 and higher | DVW-790WSP: | 40511 and higher |



## Installation

### 5. FE Head Installation

Insert two bosses of the FE head into the longitudinal hole of the entrance head assembly, and tighten the one screw.

The standard tightening torque value :

$$9 \times 10^{-2} \text{ N}\cdot\text{m} \{0.9 \text{ kgf}\cdot\text{cm}\}$$

### 6. Entrance Head Assembly Installation

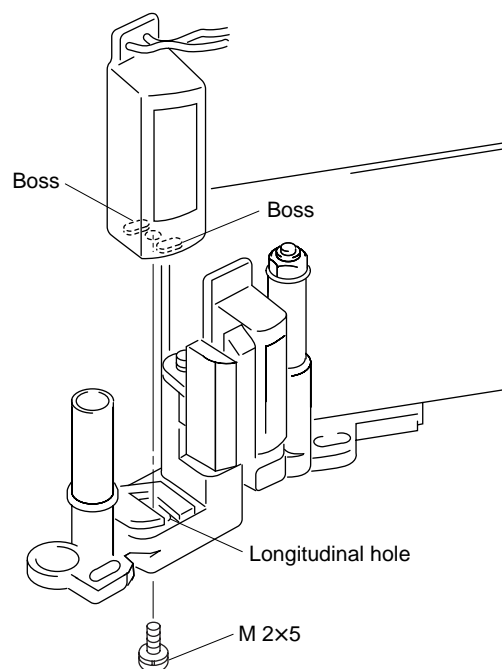
- (1) Attach the entrance head assembly with the mechanism deck using the two screws.

The standard tightening torque value :

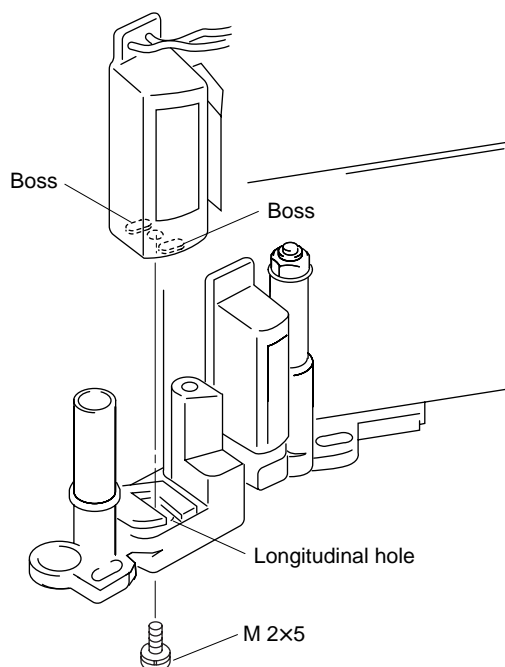
$$9 \times 10^{-2} \text{ N}\cdot\text{m} \{0.9 \text{ kgf}\cdot\text{cm}\}$$

- (2) Attach the connector.

|            |                     |             |                     |
|------------|---------------------|-------------|---------------------|
| DVW-707:   | 10001 through 10055 | DVW-707P:   | 40001 through 40190 |
| DVW-709WS: | 10001 through 10125 | DVW-709WSP: | 40001 through 40255 |
| DVW-790WS: | 10001 through 10160 | DVW-790WSP: | 40001 through 40510 |



|            |                  |             |                  |
|------------|------------------|-------------|------------------|
| DVW-707:   | 10056 and higher | DVW-707P:   | 40191 and higher |
| DVW-709WS: | 10126 and higher | DVW-709WSP: | 40256 and higher |
| DVW-790WS: | 10161 and higher | DVW-790WSP: | 40511 and higher |



## Adjustment After Replacement

### 7. Tape Running Adjustment

(Refer to section 5-1.)

## 4-2-24. Replacement of Tape Cleaner

### Notes

- Tape cleaner is not installed in the product having following serial numbers and higher.  
 DVW-707 : 10056 and higher  
 DVW-707P : 40191 and higher  
 DVW-709WS : 10126 and higher  
 DVW-709WSP : 40256 and higher  
 DVW-790WS : 10161 and higher  
 DVW-790WSP : 40511 and higher
- Do not touch the edge part of the tape cleaner directly. It is very sharp and will cause injuries.
- Do not expose the tape cleaner to shock (dropping it, etc.). As it made of very hard material, its edge may break. If it has been accidentally dropped, etc., observe the edge part with a magnifying glass and check that it has not been damaged.

### Overviews

| Replacement               |
|---------------------------|
| Tape Cleaner Removal      |
| Tape Cleaner Installation |
| Operation Check           |

### Preparations

1. Check the unthreading end mode.
2. Turn off the power.
3. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

### Tools

- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

### Removal

#### 1. Tape Cleaner Removal

Remove the screw and remove the tape cleaner.

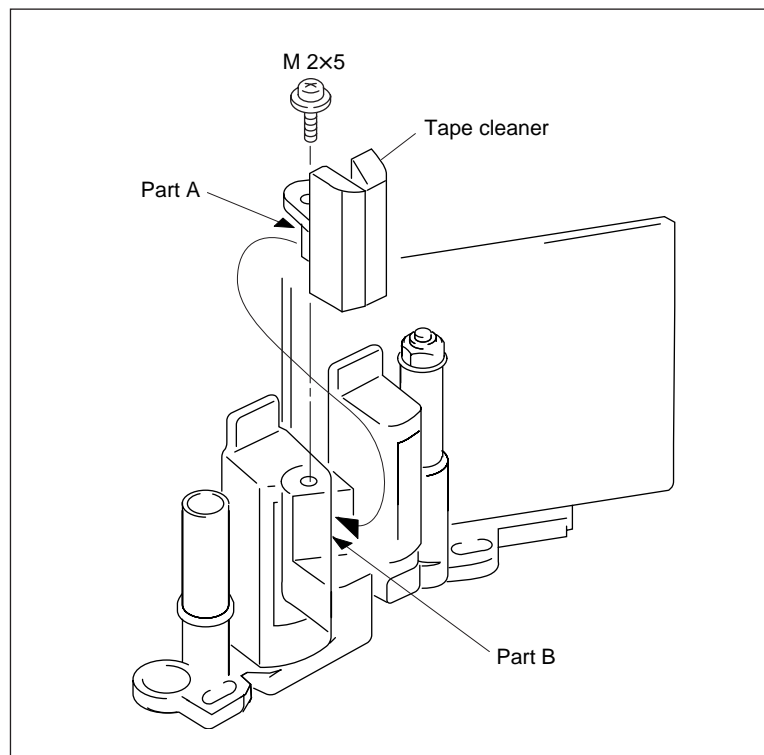
### Installation

#### 2. Tape Cleaner Installation

- (1) Press part A of the tape cleaner against part B of the CTL•FE base.
- (2) Attach the tape cleaner with a screw.  
 The standard tightening torque value :  
 $9 \times 10^{-2} \text{ N}\cdot\text{m}$  {0.9 kgf·cm}

#### 3. Operation Check

- (1) Turn on the main power.
- (2) While the outside panel is kept open, insert a cassette tape and enter the PLAY mode.
- (3) Confirm that the tape runs while maintaining contact with the tape cleaner.



## 4-2-25. Replacement of Tape Guide

### Overviews

| Replacement                  |
|------------------------------|
| Tape Guide Removal           |
| Tape Guide Installation      |
| Adjustment after replacement |
| Tape Guide Height Adjustment |
| Tape Running Adjustment      |

### Notes

- The tape guides of the unit have different shapes but their parts are replaced in the same way.
- When replacing all the tape guides, replace one by one and perform adjustments for each one. It is very difficult to adjust several tape guides at one time.
- Tighten the locking screws at the top of the tape guide using the following tightening torque.  
The standard tightening torque value :  $9 \times 10^{-2} \text{ N}\cdot\text{m}$  {0.9 kgf•cm}

### Preparations

1. Check that the unit is in the unthreading end mode.
2. Turn the power off.
3. Remove the front lid and outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)
4. Remove the cassette compartment. (Refer to section 1-8 of Maintenance Manual Part 1.)

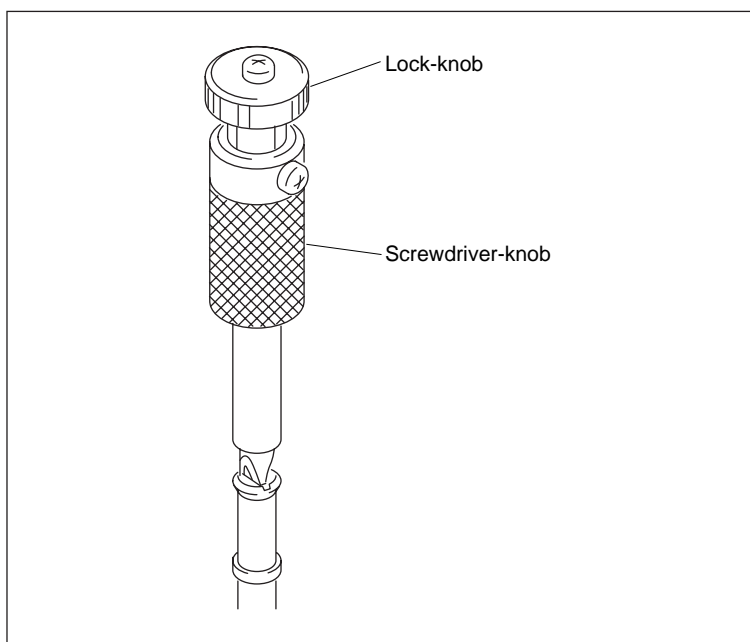
### Tools

- Tape guide adjustment screwdriver (45) : J-6325-420-A
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

### Removal

#### 1. Tape Guide Removal

- (1) Set the tape guide adjustment screwdriver on the upper flange as shown in the figure.
- (2) Rotate the screwdriver knob in the counter-clockwise direction and remove the upper flange.
- (3) Pull out the roller assembly.  
The lower flange and compression coil spring can be removed here.



## Installation

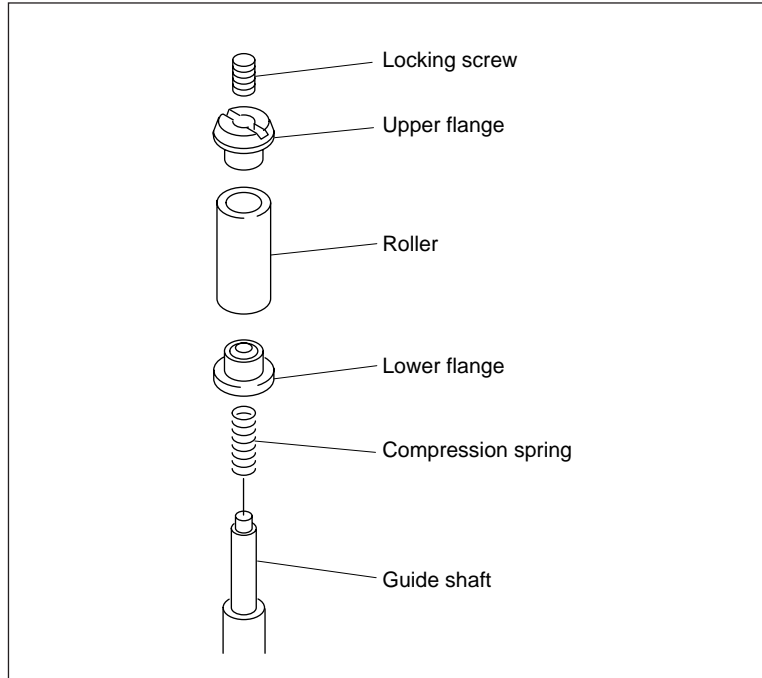
### 2. Tape Guide Installation

- (1) Pass the compression coil spring through the guide shaft.
- (2) Pass the lower flange through the guide shaft.
- (3) Pass the roller assembly through the guide shaft.

#### Note

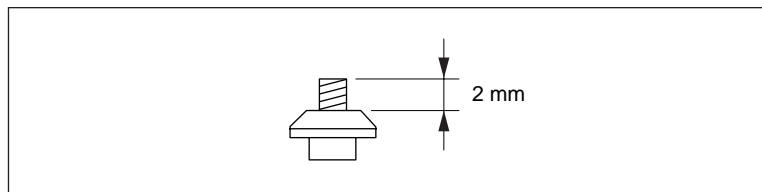
The tension regulator (S4) guide roller is tapered. Attach with the thicker side the top.

- (4) Screw in the upper flange until it touches the guide shaft.



#### Note

If the upper flange or locking screw has been replaced, perform step (4) with the locking screw protruding out of the upper flange surface about 2 mm.



## Adjustment After Replacement

### 3. Tape Guide Height Adjustment

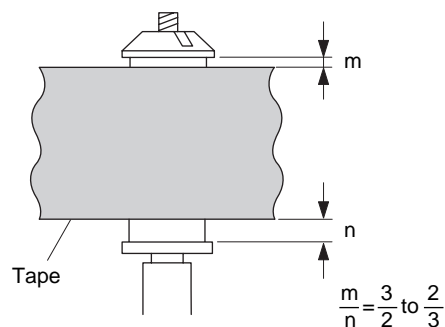
- (1) Set a tape (any available on the market) into the PLAY state and adjust the height of the tape guide so that it satisfies specification 1.

Specification1:

- (A) S5 guide and T3 guide

The tape should run without touching the upper and lower flanges.  
(See the figure.)

S5/T3 guide



- (B) Tension regulator (S4) guide

The tape should run touching the upper flange.

- (C) S3 guide

The tape should run without projecting out of the roller.

- (D) S2 guide

The tape should run touching the upper flange.

- (E) T2 guide

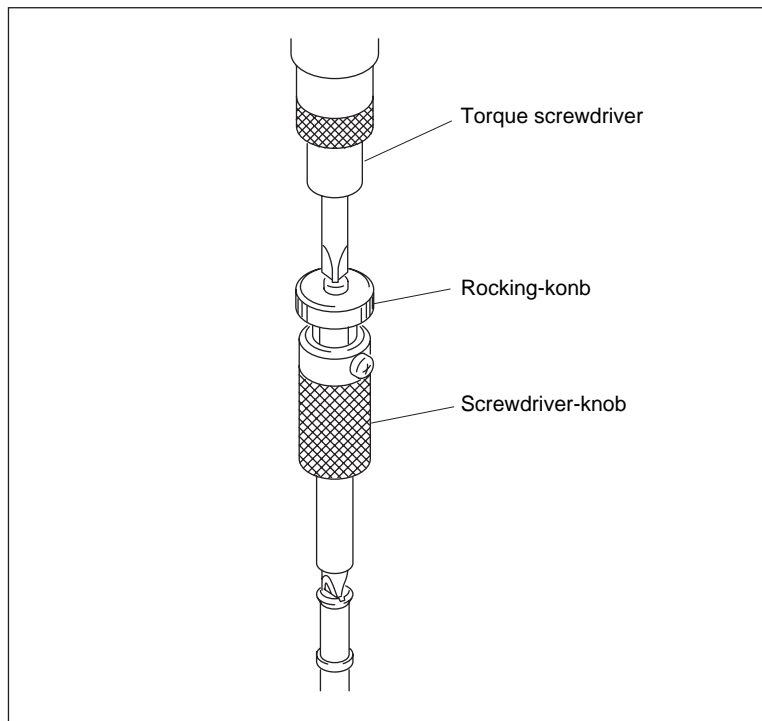
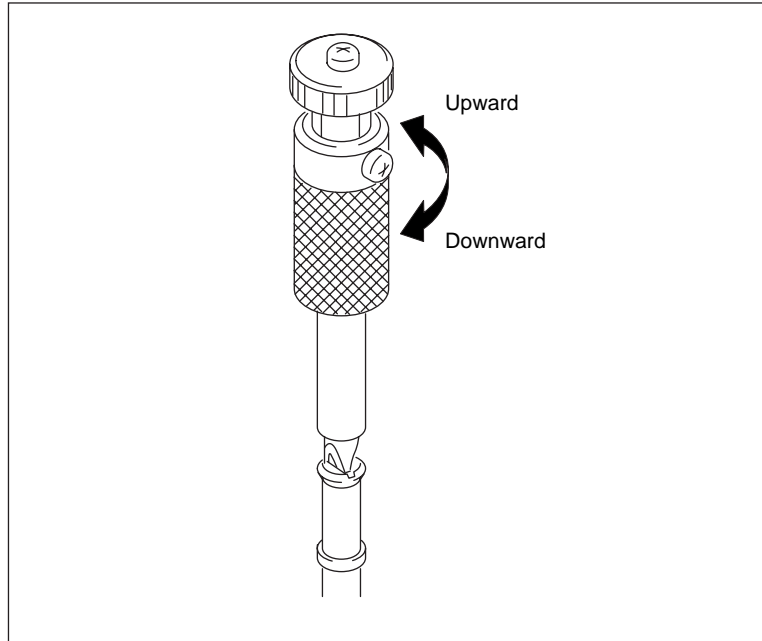
The tape should run touching the upper flange.

If the tape curls for any of the guides, this is allowed up to 1/10 of the tape width.

- (2) While holding the screwdriver so that the upper flange does not rotate, set the torque screwdriver against the plus screw of the lock knob shown in the figure and tighten the locking screw.

The standard tightening torque value :

$$9 \times 10^{-2} \text{ N}\cdot\text{m} \{0.9 \text{ kgf}\cdot\text{cm}\}$$



#### 4. Tape Running Adjustment

Perform the tape running adjustment.

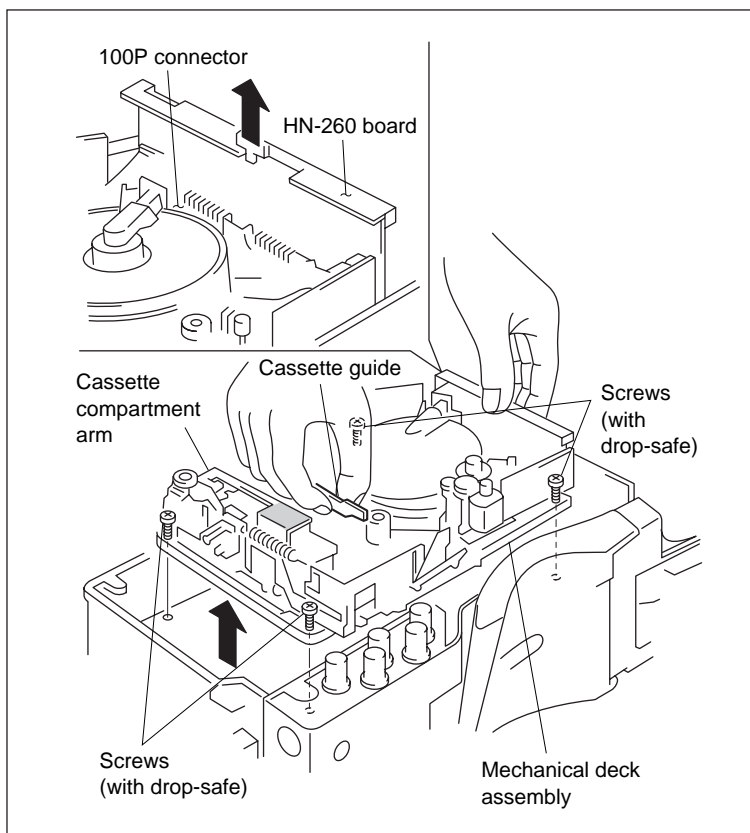
(Refer to section 5-1.)



## 4-2-26. Mechanical Deck Replacement

### 1. Removing the Mechanical Deck

- (1) Remove the outside panel.
- (2) Remove the four screws and remove the mechanical deck.

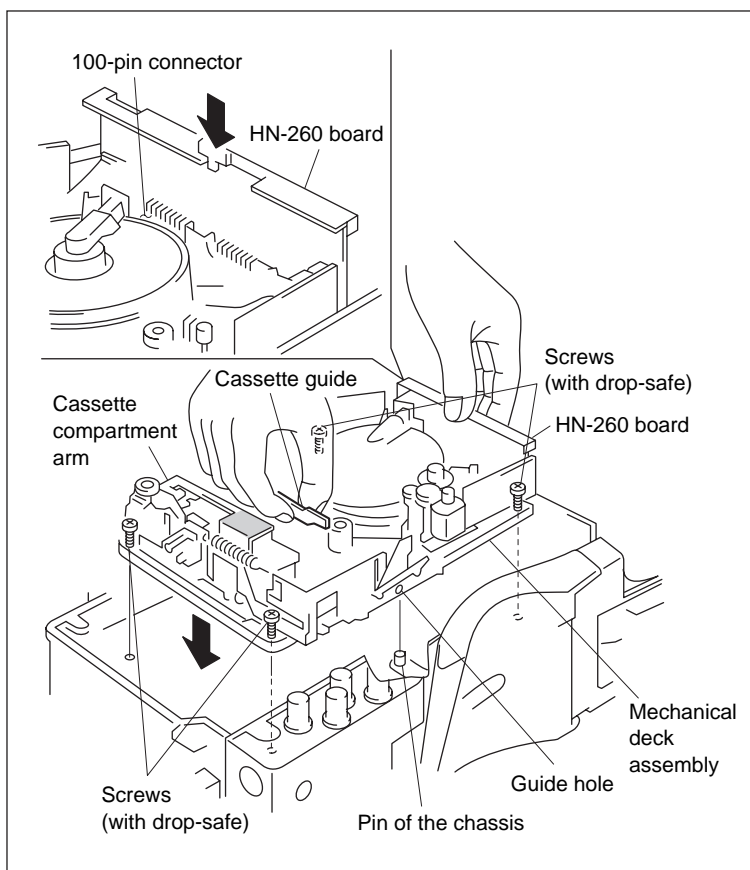


### 2. Attaching the Mechanical Deck

- (1) Hold the portion of the cassette compartment that is shown by shading in the illustration, or the cassette guide, and the HN-260 board. Then, align the two holes of the mechanical deck assembly with the two pins on the chassis, and attach the mechanical deck to the chassis.
- (2) Press the ornamental panel of the HN-260 board firmly downward, and connect the 100P connector to the mother board.
- (3) Tighten the four screws of the mechanical deck assembly.

The standard tightening torque value :

$$19 \times 10^{-2} \text{ N} \cdot \text{m} \{ 1.9 \text{ kgf} \cdot \text{cm} \}$$



## 4-3. Mechanical Adjustment

### 4-3-1. Tension Regulator Operating Position Adjustment

#### Note

When replacing the S brake assembly or S reel table assembly, be sure to carry out tension regulator operating position adjustment.

#### Preparations

1. Check that the unit is in the unthreading end mode.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)
3. Remove the cassette compartment. (Refer to section 1-8 of Maintenance Manual Part 1.)

#### Note

The tension regulator operating position check can be carried out when the cassette compartment is attached to the unit.

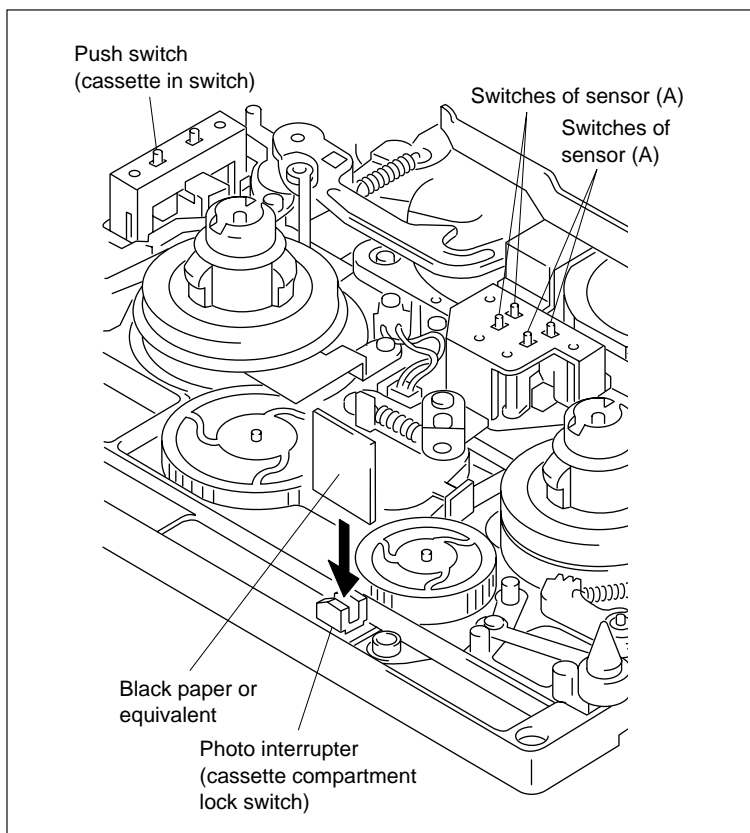
#### Tools

- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

## Check

### 1. Mode Selection

- (1) Turn the power on.
  - (2) Interrupt the photo interrupter (cassette compartment lock switch) mounted on the SE-210 board using a black paper or equivalent.
  - (3) Press the push switch (cassette in switch) mounted on the SE-210 board by finger.
- In this way the unit will be in the threading end mode without a cassette tape.



## 2. Tension Regulator Operating Position Check

Check that the position of the boss on the tension regulator shown in the figure satisfies the following specification.

**Specification :** The boss is positioned between the outer circumference of the boss touches the elongation line of the edge portion of tape end sensor bracket (black color) and the center of the boss is on the elongation line of the edge portion of the tape end sensor bracket.

If the specification is not satisfied, check that the position of the boss shifts to either direction A or B against the elongation line of the edge portion of tape end sensor bracket. After checking, perform step 3.

### Adjustment

## 3. Position Adjustment

- (1) Loosen the screw of the band base about 1/3 turn.
- (2) Put the (–) 3 mm screwdriver in the notch shown in the figure and adjust the position of the band base so that satisfies the specification.

### Point for adjustment

- If the tension regulator shifts to the direction A, turn the screwdriver clockwise.
- If the tension regulator shifts to the direction B, turn the screwdriver counterclockwise.

- (3) While keeping the state of step the (2), tighten the screw of the band base.

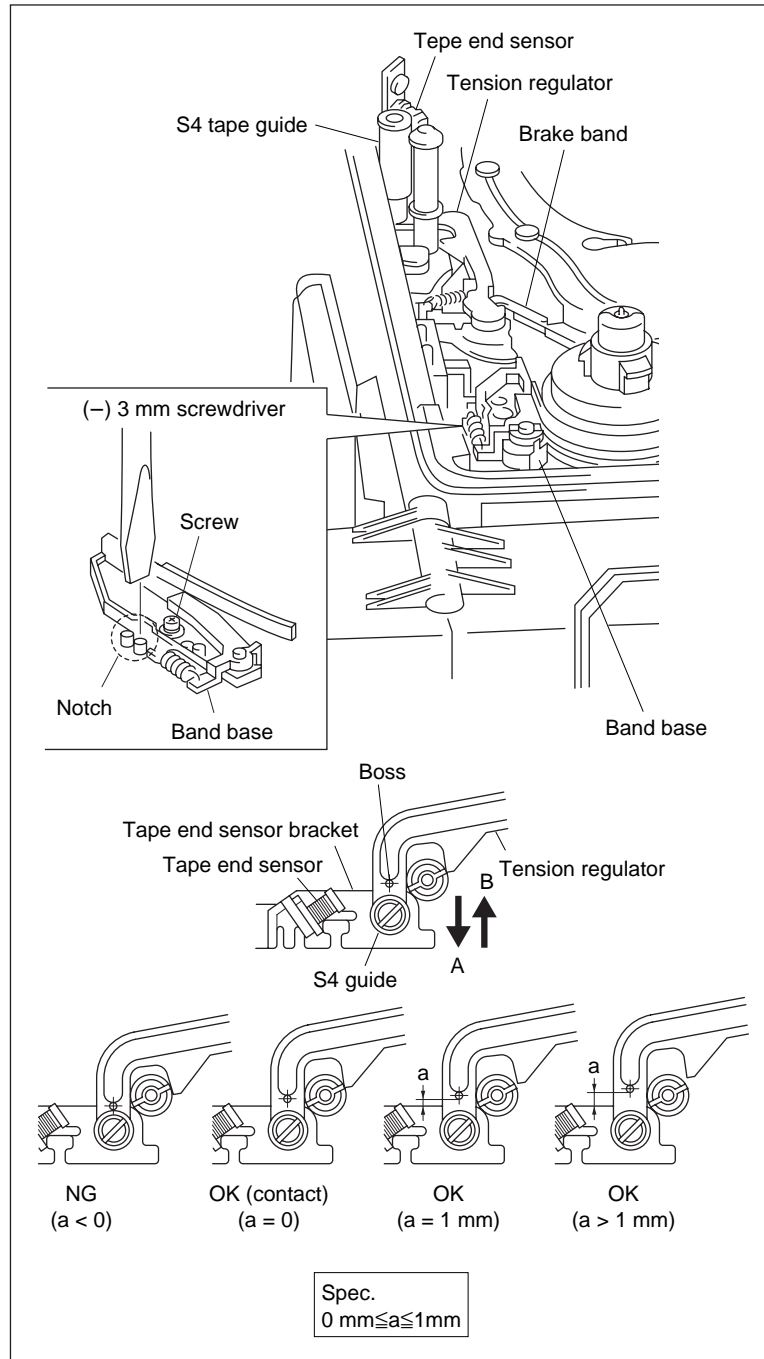
## 4. Mode Cancel

Press the EJECT button and put the unit is in the unthreading end mode.

## 5. FWD Back Tension Adjustment

Carry out the FWD back tension adjustment.

(Refer to section 4-3-2.)



### 4-3-2. FWD Back Tension Adjustment

**Note**

When replacing the brake band assembly or S reel table assembly, or carrying out the tension regulator operating position adjustment, be sure to carry out FWD back tension adjustment.

**Preparations**

1. Check that the unit is in the unthreading end mode.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

**Note**

For this adjustment, it is recommended to attach the cassette compartment to the unit.

If the cassette compartment does not attach to the unit, interrupt the photo interrupter (cassette compartment lock switch) mounted on the SE-210 board using a black paper or equivalent so that the unit is in the cassette lock state. After placing a weight on a FWD back tension measuring cassette tape so as not to rise it up, carry out this adjustment.

**Tool**

FWD back tension measuring cassette tape : J-6323-890-A

## Check

### 1. REC Mode Setting

Insert a FWD back tension measuring cassette tape, and put into the recording mode.

### 2. FWD Back Tension Check

Check that the value of the FWD back tension measuring cassette tape at the S side satisfies the specification. If the specification is not satisfied, perform step 3 and higher after checking that the value is larger or smaller than the specification.

## Adjustment

### 3. EJECT Mode Setting

Eject the FWD back tension measuring cassette tape.

### 4. Back Tension Adjustment

Change the position of the spring on the tension regulator arm block.

### Reference of adjustment

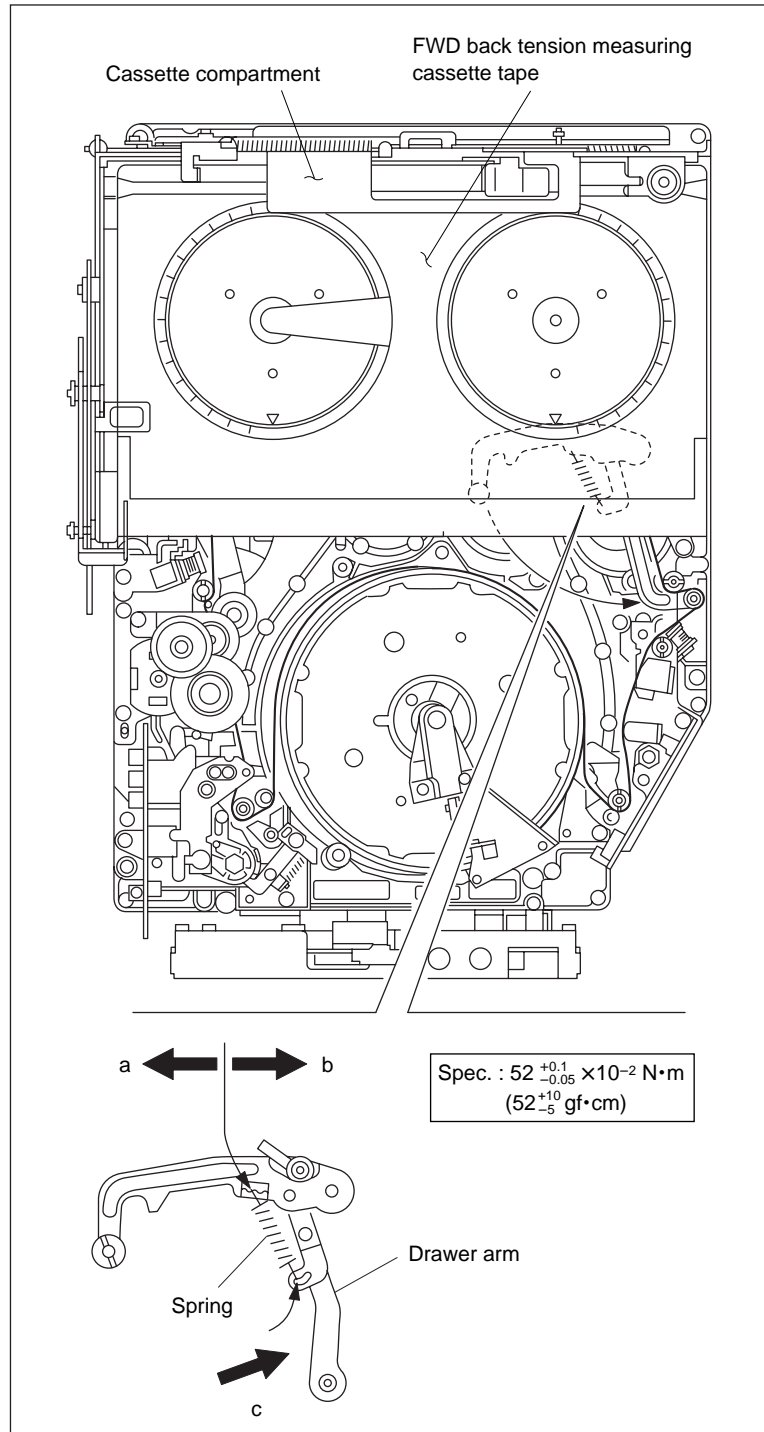
- If the value is larger than the specification, move the position of the spring to the direction b.
- If the value is smaller than the specification, move the position of the spring to the direction a.

### 5. FWD Back Tension Check After Adjustment

Perform out the steps 1 and 2 and check that the value satisfies the specification.

#### Note

If the value is not satisfies the specification after performing step 4, move the position of the spring at the drawer arm side to the direction c. Perform step 4 again and re-adjust.



### 4-3-3. Brake Torque Check

**Note**

When replacing the T soft brake assembly or T reel table assembly, be sure to carry out brake torque check.

**Preparations**

1. Check that the unit is in the unthreading end mode.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

**Tool**

- FWD back tension measuring cassette tape : J-6323-890-A

## Check

### 1. Setting

- (1) Insert the FWD back tension measuring cassette tape.
- (2) Select the dip switch S1-1 on the HN-260 board to the ON.  
In this way the red LED will light up.
- (3) Press the switch S3 on the HN-210 board 10 times.  
After pressing, check that the Nos. 1 and 3 of the MODE display LEDs light up.
- (4) Press the REW button. In this way the unit enters the REV×1 mode.

### 2. T Side Brake Torque Check

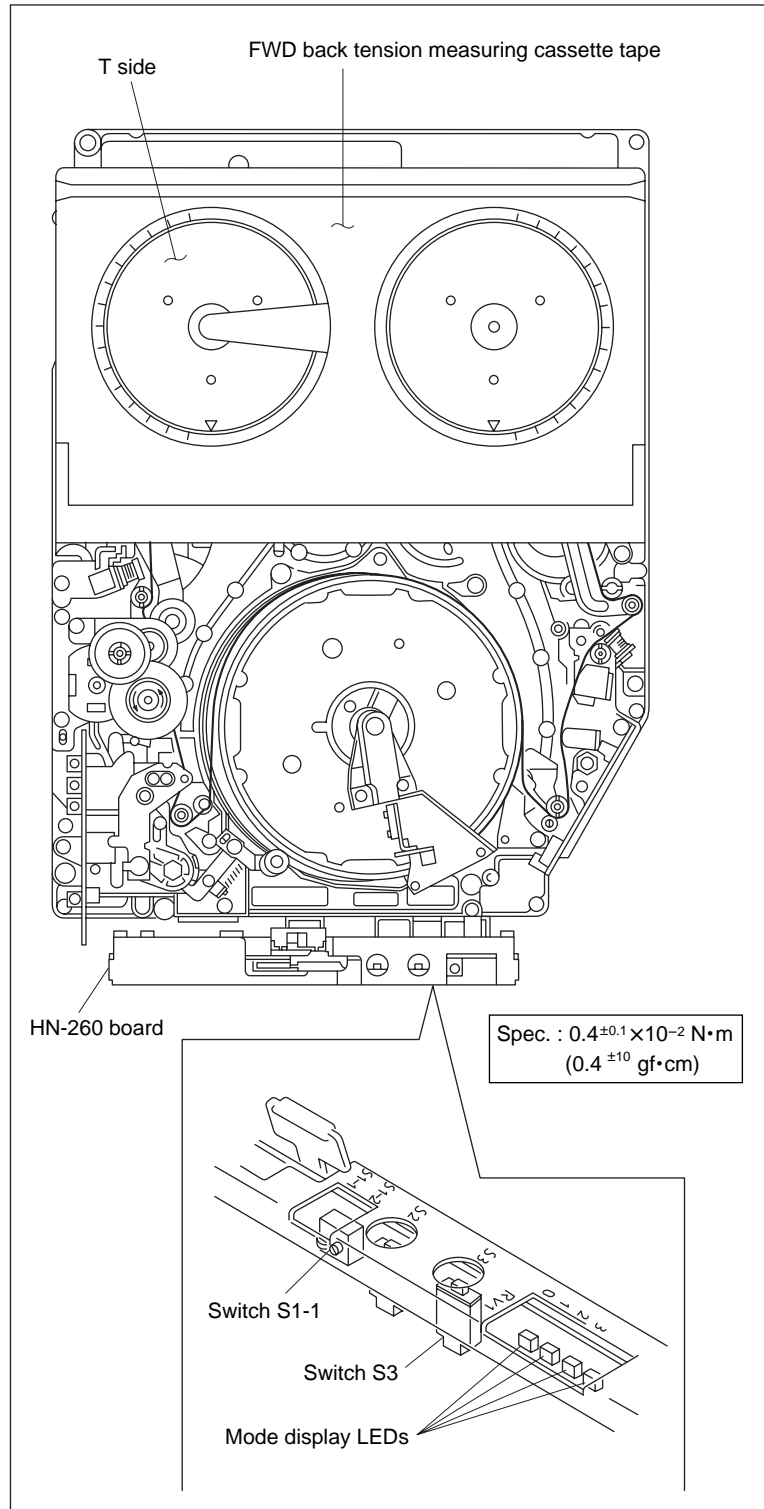
Check that the value of the FWD back tension measuring cassette tape at the T side meets the specification.

#### In case that the value does not meet the specification

- Check that the T soft brake assembly properly attaches to the unit according to section 4-2-9.
- Or
- Replace the T soft brake assembly according to section 4-2-9.

### 3. Adjustment Mode Cancel

- (1) Put the unit into the STOP mode.
- (2) Select the dip switch S1-1 on the HN-260 board to the OFF.  
Check that the red LED is turned off.





## 4-3-4. Belt Tension Adjustment

### Note

When replacing the swing gear assembly, capstan motor or timing belt, be sure to carry out belt tension adjustment.

### Preparations

1. Check that the unit is in the unthreading end mode.
2. Remove the front lid and the outside panel. (Refer to section 1-6 of Maintenance Manual Part 1.)

### Tools

- Torque screwdriver bit (for M1.4) : J-6325-110-A
- Torque screwdriver (for 3 kg) : J-6325-400-A

### Adjustment

#### 1. Belt Tension Adjustment

- (1) Check that the spring and its hook shown in the figure of the swing gear assembly are not deformed.

#### Note

The belt tension automatically is adjusted by this tension spring.

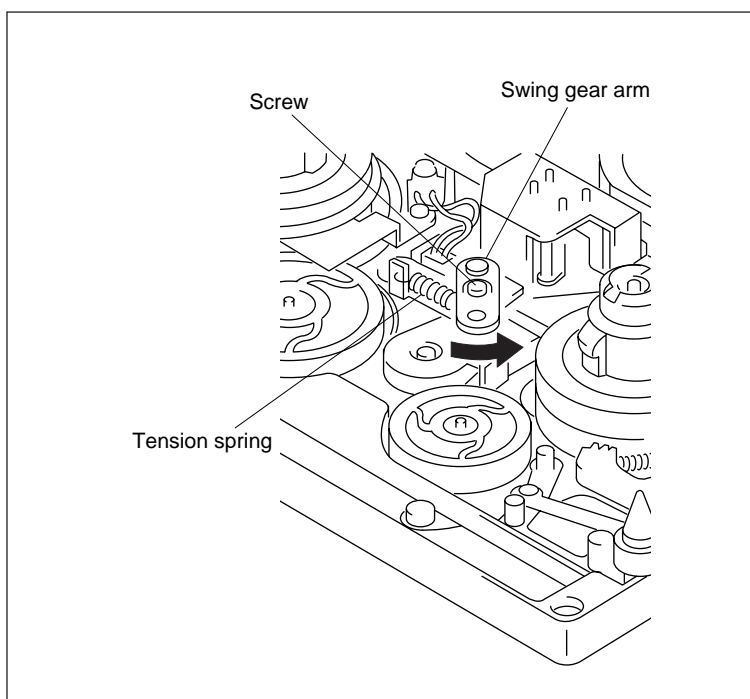
Before this adjustment, check that the spring and its hook are not deformed.

If the spring or its hook is deformed, replace it before this adjustment.

- (2) Loosen the screw shown in the figure 1 or 2 turns.
- (3) After pressing the swing gear arm in the direction of the arrow by finger, release it.  
The swing gear arm will automatically return to the correct position by the power of the spring.
- (4) Tighten the screw loosened in the step (2).

#### Note

When tightening the screw, never hold the swing gear assembly block by finger.





# Section 5

## Tape Path Adjustment

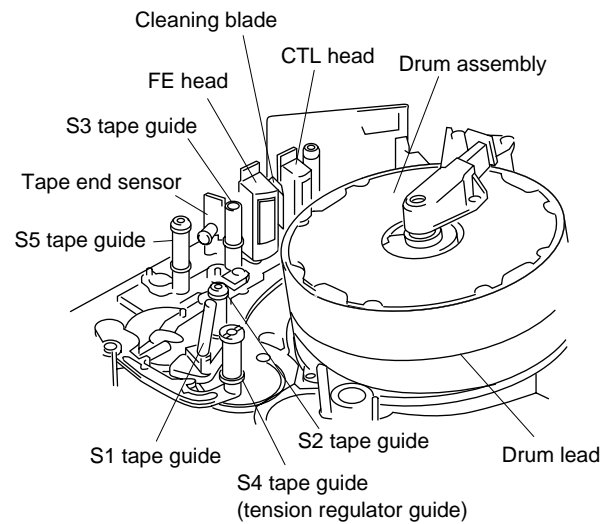
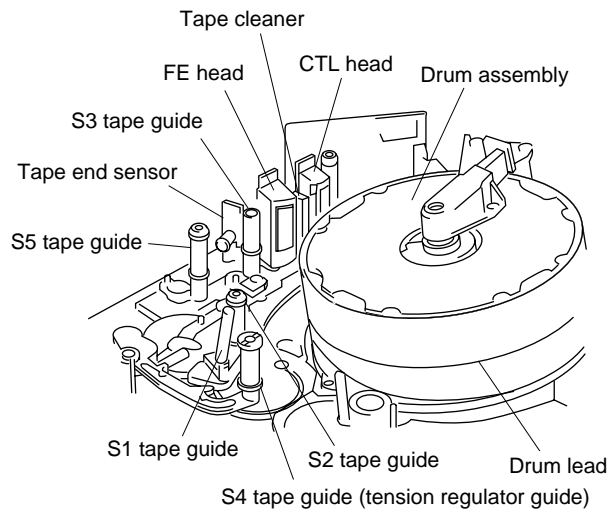
### Index

#### 1. Location of Tape Path System

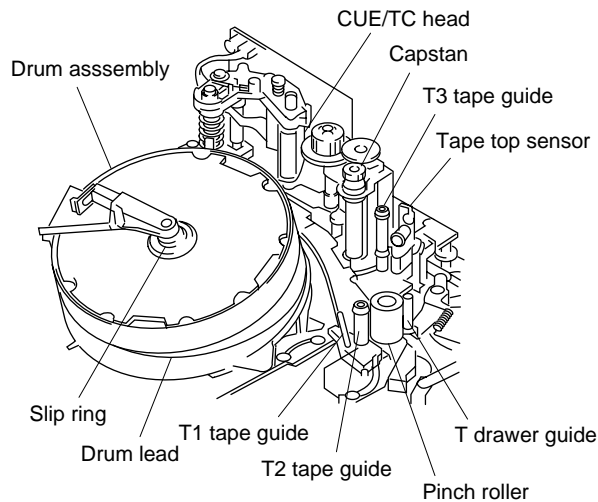
##### Drum Entrance Side (Unthreading End Mode)

DVW-707 : 10001 through 10055  
 DVW-709WS : 10001 through 10125  
 DVW-790WS : 10001 through 10160  
 DVW-707P : 40001 through 40190  
 DVW-709WSP : 40001 through 40255  
 DVW-790WSP : 40001 through 40510

DVW-707 : 10056 and higher  
 DVW-709WS : 10126 and higher  
 DVW-790WS : 10161 and higher  
 DVW-707P : 40191 and higher  
 DVW-709WSP : 40256 and higher  
 DVW-790WSP : 40511 and higher



##### Drum Exit Side (Unthreading End Mode)



## 2. Note

- About cassette compartment

Carry out the tape path adjustment in the state that the cassette compartment is attached to the unit.

## 3. Preparations

- (1) Turn the power off.
- (2) Remove the front lid and the outside panel. (Refer to Maintenance Manual Part1 section 1-6.)
- (3) Clean the following items using a cleaning cloth moistened with cleaning fluid.
  - Video heads (Refer to Maintenance Manual Part1 section 7-1-2.)
  - Tape running surface of the upper drum (Refer to Maintenance Manual Part1 section 7-1-2.)
  - Tape running surface of the lower drum and the lead surface (Refer to Maintenance Manual Part1 section 7-1-3.)
  - Stationary heads (Refer to Maintenance Manual Part1 section 7-1-4.)
  - Tape cleaner (Refer to Maintenance Manual Part1 section 7-1-5.)
  - All tape guides
  - Capstan shaft
  - Pinch roller

## 4. Tools

- Tape guide adjustment screwdriver (45) : J-6322-420-B
- TP tool : J-6420-910-A
- Inspection mirror : J-6080-840-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Alignment tape, ZR2-1 (for NTSC) : 8-960-073-11
- Alignment tape, ZR2-1P (for PAL) : 8-960-073-61

### Contents

| TIME<br>min. sec.                       | CTL TRACK | CUE TRACK    | VIDEO/AUDIO<br>TRACK             | USE  |
|---|-----------|--------------|----------------------------------|--|
| 00:00<br> <br>(7:3 PULSE)<br> <br>15:00 | CTL       | 1 kHz, 0 VU  | 4 MHz<br>(A CH only)             | <ul style="list-style-type: none"> <li>• Video tracking adjustment</li> <li>• CTL head position adjustment</li> <li>• CUE head height adjustment</li> <li>• CUE/TC head position adjustment</li> </ul> |
| 20:00                                   | CTL       | 12 kHz, 0 VU | A/C CH : 4 MHz<br>B/D CH : 8 MHz | <ul style="list-style-type: none"> <li>• CUE/TC head azimuth adjustment</li> <li>• CUE/TC head head-to-tape contact adjustment</li> </ul>  |
| 25:00                                   | CTL       | 12 kHz, 0 VU | 16 MHz<br>(ALL CHANNEL)          |  |
| 27:00                                   | CTL       | --           | 50% FLATFIELD<br>(ALL CHANNEL)   |  |

\* The CTL head height adjustment can be used at any portion of this alignment tape.

## 5-1. Tape Running Adjustment

### Notes

- When carrying out the tape running adjustment after replacing the part of the tape path system, first carry out the checks and adjustments of the tape running using a Digital Betacam cassette tape BCT-D40. Next carry out the checks and fine adjustments of the tape running using an alignment tape ZR2-1/P.
- The following checks and adjustments are described in the state that the alignment tape ZR2-1/P uses.
- Tighten the screws at the top of the tape guides to the following tightening torque.  
 $9 \times 10^{-2} \text{ N} \cdot \text{m}$  (0.9 kgf·cm)
- After adjustment, be sure to check the video tracking adjustment.  
 After checking, put a locking compound to the screws at the top of each tape guide.

### Drum Entrance Side

#### Tools

- Tape guide adjustment screwdriver (45) : J-6322-420-B
- Inspection mirror : J-6080-840-A
- Alignment tape, ZR2-1 (for NTSC) : 8-960-073-11
- Alignment tape, ZR2-1P (for PAL) : 8-960-073-61
- Cassette tape, BCT-D40 : Standard products

#### Checks

##### 1. PLAY Mode (Playing back the tape top)

Enter the play mode at the tape top of ZR2-1/P (from 5 minute to 10 minute segment).

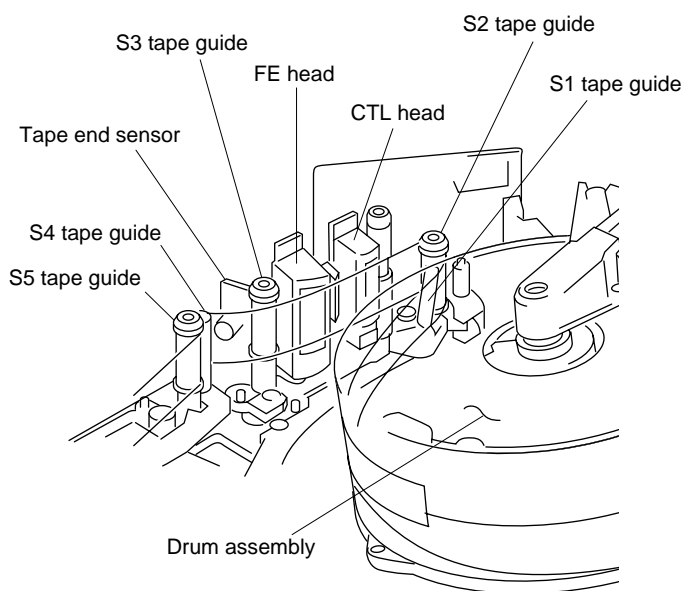
Check that the tape running conditions satisfy the specifications 1.

If the specifications 1 is not satisfied, perform step 8 and higher.

#### Specifications 1 :

- (A) S5 guide  
 There must a clearance between top edge of the tape and the upper flange, and a clearance between the bottom edge of the tape and the lower flange.  
 Ratio of the top clearance to the bottom clearance is 3/2 to 2/3 as the clearance specification.
- (B) Tension regulator guide  
 Tape must run while maintaining contact with the upper flange.  
 Acceptable range of the tape curl is 1/10 or less of a tape width.
- (C) S2 guide  
 Tape must run while maintaining contact with the upper flange.  
 Acceptable range of the tape curl is 1/10 or less of a tape width.
- (D) Drum lead  
 Tape must run while maintaining contact with the drum rabbet guide without any curl.

#### Drum Entrance Side (Threading End Mode)



## 2. F FWD Mode (Fast forward at tape top)

Enter the F FWD mode at the tape top of ZR2-1/P (from 5 minute to 10 minute segment).

Check that the tape running conditions satisfy the specifications 1.

If the specifications 1 is not satisfied, perform step 8 and higher.

## 3. REW Mode (Rewind at tape top)

Enter the REW mode at the tape top of ZR2-1/P (from 5 minute to 10 minute segment).

Check that the tape running conditions satisfy the specifications 1.

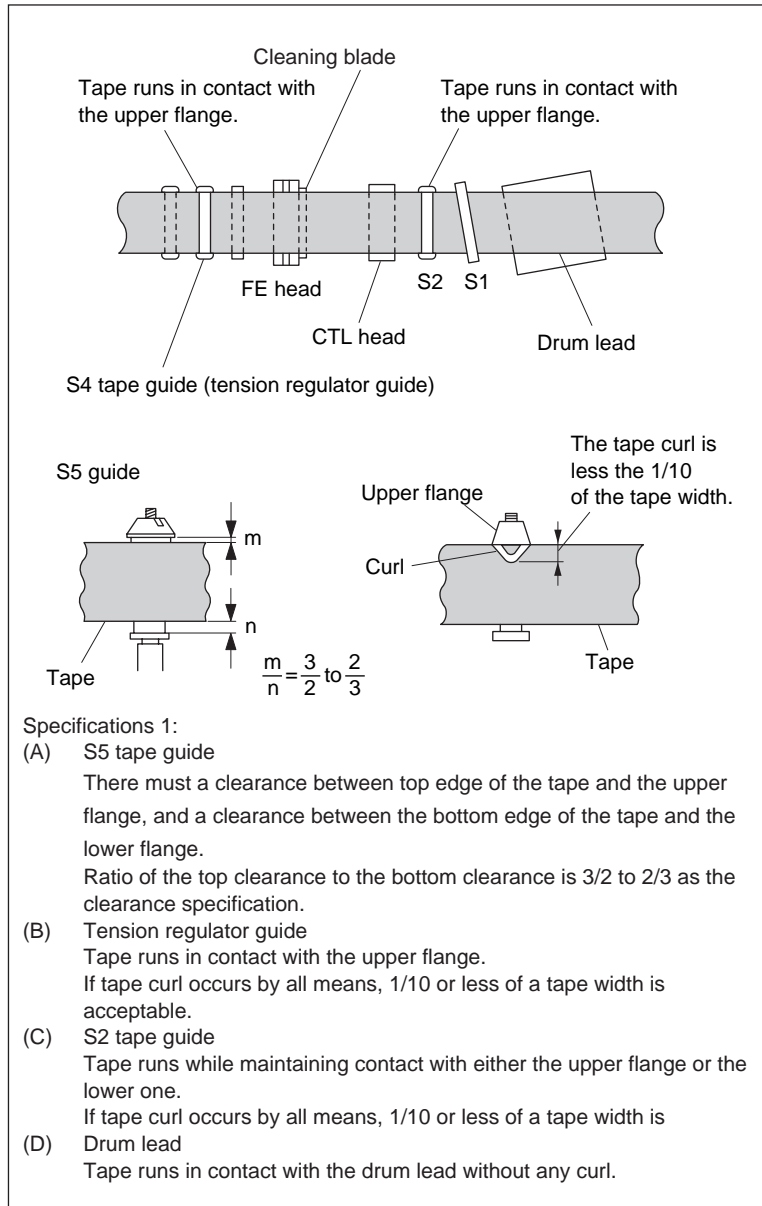
If the specifications 1 is not satisfied, perform step 8 and higher.

## 4. PLAY Mode (Playback at tape end)

Enter the PLAY mode at the tape end of BCT-D40 (from 30 minute to 40 minute segment).

Check that the tape running conditions satisfy the specifications 1.

If the specifications 1 is not satisfied, perform step 8 and higher.



## 5. REV Mode (Rewind at tape end)

- (1) Set the dip switch S1-1 on the HN-260 board to ON.

The red LED will light up.

- (2) Press the switch S3 on the HN-260 board 10 times. After pressing, check that the Nos. 1 and 3 of the MODE display LEDs light up.

- (3) Enter the PLAY mode at the tape end of BCT-D40 (from 30 minute to 40 minute segment).

After 2 or 3 seconds, press the REW button.

This setting enables the unit to enter the REV×1 mode.

Check that the tape running conditions satisfy the specifications 2 at the tension regulator and S5 guides.

If the specifications 2 is not satisfied, perform step 8 and higher.

- (4) Set the dip switch S1-1 on the HN-260 board to OFF.

The red LED will be turned off.

### Specifications 2:

- (A) Upper flange of the S2 guide  
Tape runs without any curl.  
If tape curl occurs by all means, 1/10 or less of a tape width is acceptable.
- (B) Upper or lower flange of the tension regulator guide  
Tape runs without any curl.  
If tape curl occurs by all means, 1/10 or less of a tape width is acceptable.
- (C) Upper or lower flange of the S5 guide  
Tape runs without any curl.  
If tape curl occurs by all means, 1/10 or less of a tape width is acceptable.
- (D) Drum lead  
Tape runs in contact with the drum lead and without any curl.

## 6. F FWD Mode

### (Fast forward at tape end)

Enter the F FWD mode at the tape end of BCT-D40 (from 30 minute to 40 minute segment).

Check that the tape running conditions satisfy the specifications 3.

If the specifications 3 is not satisfied, perform step 8 and higher.

### Specifications 3:

- (A) Upper flange of the S2 guide  
Tape runs without any curl.  
If tape curl occurs by all means, 1/10 or less of a tape width is acceptable.
- (B) Upper or lower flange of the tension regulator guide  
Tape runs without any curl.  
If tape curl occurs by all means, 1/10 or less of a tape width is acceptable.
- (C) Upper or lower flange of the S5 guide  
Tape runs without any curl.  
If tape curl occurs by all means, 1/10 or less of a tape width is acceptable.

## 7. REW Mode (Rewind at tape end)

Enter the REW mode at the tape end of BCT-D40 (from 30 minute to 40 minute segment). Check that the tape running conditions satisfy the specifications 3.

If the specifications 3 is not satisfied, perform step 8 and higher.

---

## Adjustments

### 8. S2, Tension Regulator and S5 Guides Height Adjustment

- (1) Enter the PLAY mode at the tape top of ZR2-1/P (from 5 minute to 10 minute segment).
- (2) Loosen the set screws at the top of the guides using the tape guide adjustment screwdriver. Turn the upper flanges of the guides, and adjust the heights of the guides so that satisfy the specifications 1 to 3.
- (3) Tighten the screws at the top of the guides.

### 9. Tape Running Re-check at the Drum Entrance Side

Perform from the steps 1 to 7 of the check procedures, and re-check that the specifications are satisfied.

If the specifications are not satisfied, perform step 8 again.

### 10. Tape Running Check at the Drum Exit Side.

Check the tape running at the drum exit side on the following page and later.

---

## Checks After Adjustment

### 11. Video Tracking Check

Refer to section 5-2.

### 12. CTL Head Height Check

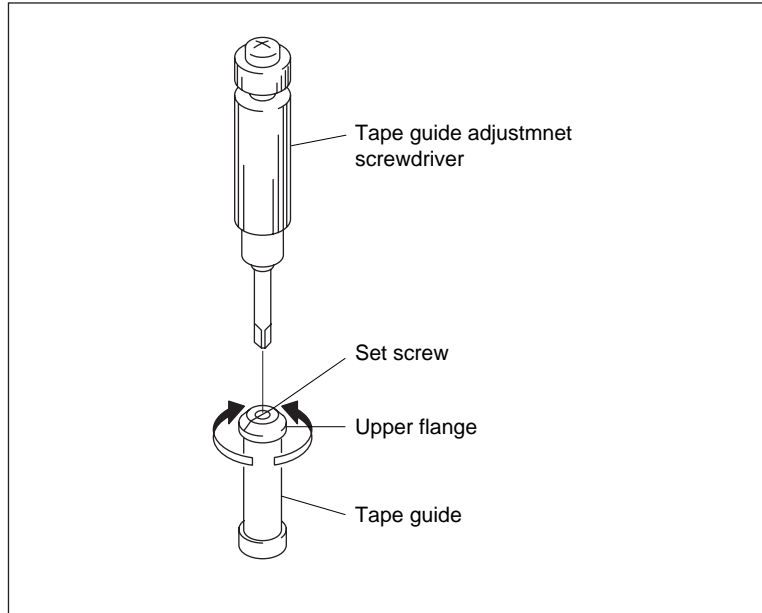
Refer to section 5-3.

### 13. CTL Head Position Check

Refer to section 5-4.

### 14. CUE/TC Head Position Check

Refer to section 5-8.





## Drum Exit Side

### Checks

#### 1. PLAY Mode

##### (Playing back the tape top)

Enter the play mode at the tape top of ZR2-1/P (from 5 minute to 10 minute segment).

Check that the tape running conditions satisfy the specifications 4.

If the specifications 4 is not satisfied, perform step 9 and higher.

#### 2. F FWD Mode

##### (Fast forward at tape top)

Enter the F FWD mode at the tape top of ZR2-1/P (from 5 minute to 10 minute segment).

Check that the tape running conditions satisfy the specifications 4.

If the specifications 4 is not satisfied, perform step 9 and higher.

#### 3. REW Mode (Rewind at tape top)

Enter the REW mode at the tape top of ZR2-1/P (from 5 minute to 10 minute segment).

Check that the tape running conditions satisfy the specifications 4.

If the specifications 4 is not satisfied, perform step 9 and higher.

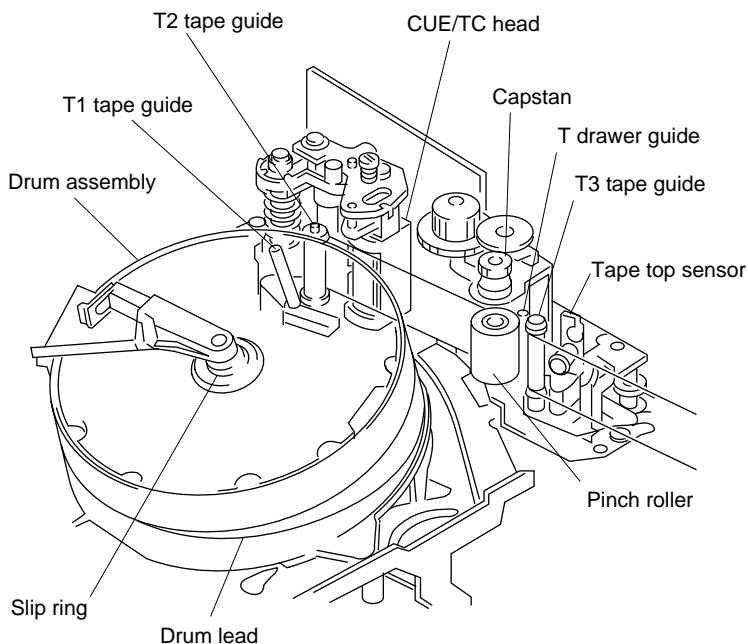
#### 4. PLAY Mode (Playback at tape end)

Enter the PLAY mode at the tape end of BCT-D40 (from 30 minute to 40 minute segment).

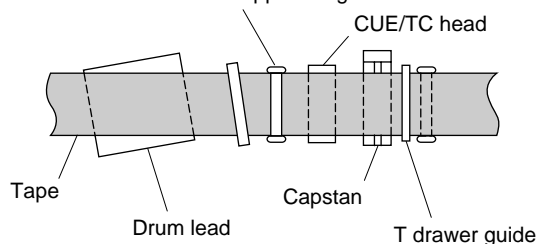
Check that the tape running conditions satisfy the specifications 4.

If the specifications 4 is not satisfied, perform step 9 and higher.

### Drum Exit Side (Threading End Mode)



Tape runs in contact with the upper flange



Specifications 4:

- (A) T2 guide  
Tape runs in contact with the upper flange.  
Acceptable range of the tape curl is 1/10 or less of a tape width.
- (B) T3 guide  
Tape runs not in contact with upper and lower flanges.
- (C) Drum lead  
Tape runs in contact with the drum lead and without any curl.

## 5. REV Mode (Rewind at tape end)

- (1) Set the dip switch S1-1 on the HN-260 board to ON.  
The red LED will light up.
- (2) Press the switch S3 on the HN-260 board 10 times.  
After pressing, check that the Nos. 1 and 3 of the MODE display LEDs light up.
- (3) Enter the PLAY mode at the tape end of BCT-D40 (from 30 minute to 40 minute segment).  
After 2 or 3 seconds, press the REW button.  
The unit to enter the REV×1 mode.  
Check that the tape running conditions satisfy the specifications 5 at the T3 guides.  
If the specifications 5 is not satisfied, perform step 9 and higher.
- (4) Set the dip switch S1-1 on the HN-260 board to OFF.  
The red LED will be turned off.

### Specifications 5:

- (A) T2 guide  
Tape runs in contact with the upper flange.  
If tape curl occurs by all means, 1/10 or less of a tape width is acceptable.
- (B) T3 guide  
Tape runs without any curl at the upper flange.  
The tape has the clearance between lower flange and edge at the bottom of the tape.  
The tape running position when the REV mode is not lower more than it when the PLAY mode.
- (C) Drum lead  
Tape runs in contact with the drum lead and without any curl.

## 6. F FWD Mode (Fast forward at tape end)

Enter the F FWD mode at the tape end of BCT-D40 (from 30 minutes to 40 minute segment).  
Check that the tape running conditions satisfy the specifications 6.  
If the specifications 6 is not satisfied, perform step 9 and higher.

### Specifications 6:

- (A) Upper flange of the T2 guide  
Tape runs without any curl.  
If tape curl occurs by all means, 1/10 or less of a tape width is acceptable.
- (B) Upper and lower flanges of the T3 guide  
Tape runs without any curl.

## 7. REW Mode (Rewind at tape end)

Enter the REW mode at the tape end of BCT-D40 (from 30 minute to 40 minute segment).  
Check that the tape running conditions satisfy the specifications 6.  
If the specifications 6 is not satisfied, perform step 9 and higher.

## 8. Tape Running Check Around the Capstan Shaft

- (1) Enter the REW mode at tape end of BCT-D40 (from 30minute to 40 minute). After 2 or 3 seconds, enter the F FWD mode.

When changing the mode, check that the tape running conditions satisfy the specifications 7 between CUE head and capstan shaft. If the specifications 7 is not satisfied, perform step 9 and higher.

- (2) Repeat the step (1) 2 or 3 times and re-check.

- (3) Enter the F FWD mode, and after 2 or 3 seconds enter the REW mode.

When changing the mode, check that the tape running conditions satisfy the specifications 7 between CUE head and capstan shaft. If the specifications 7 is not satisfied, perform step 9 and higher.

- (4) Select the dip switch S1-1 on the HN-260 board to the ON.

The red LED will light up.

- (5) Press the switch S3 on the HN-260 board 10 times.

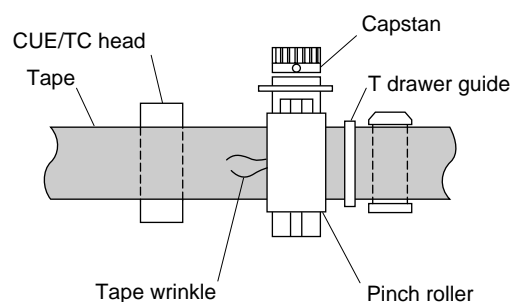
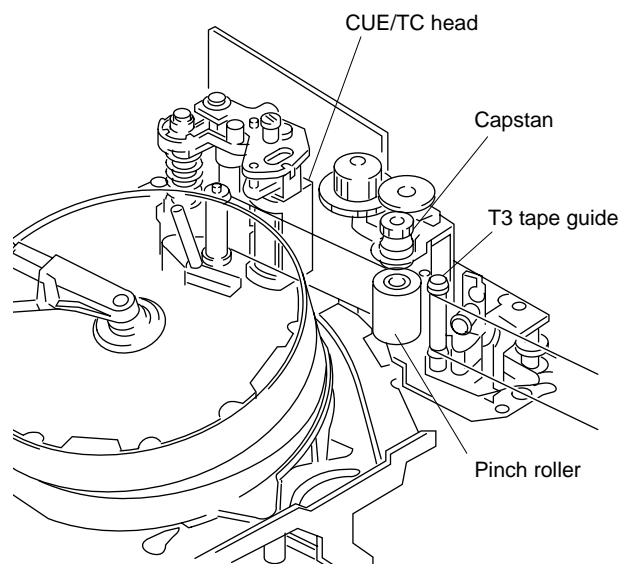
After pressing, check that the Nos. 1 and 3 of the MODE display LEDs light up.

- (6) Enter the REV×1 mode by pressing the REW button. After 2 or 3 seconds, press the PLAY button.

When changing the mode, check that the tape running conditions satisfy the specifications 7 between CUE head and capstan shaft. If the specifications 7 is not satisfied, perform step 9 and higher.

- (7) Select the dip switch S1-1 on the HN-260 board to the OFF.

The red LED will be turned off.



### Specifications 7:

Tape runs without any wrinkle.

If the tape wrinkle occurs, check that the tape wrinkle disappears within 2 seconds and do not damage the tape.

---

## Adjustments

### 9. T2 and T3 Guides Height Adjustment

- (1) Enter the PLAY mode at the tape top of ZR2-1/P (from 5 minute to 10 minute segment).
- (2) Loosen the set screws at the top of the guides using the tape guide adjustment screwdriver. Turn the upper flanges of the guides, and adjust the heights of the guides so that satisfy the specifications 4 to 7.

#### Reference for adjustment

If case that the specification is not satisfied when REV×1 mode

- Turn the upper flange of the T3 guide when the REV×1 mode and adjust the height so that the tape runs without any curl.
- After this adjustment, enter the PLAY mode and check that the clearance between upper and lower flanges of the T3 guide and tape.

- (3) Tighten the set screws at the top of the guides.

### 10. Tape Running Re-check at the Drum Exit Side

Perform the steps 1 to 8 of the check procedures, re-check that the specifications satisfy.

If the specifications are not satisfied, re-carry out the adjustment of the step 9.

### 11. Tape Running Re-check at the Drum Entrance Side

Re-check the tape running adjustment at the drum entrance side.

---

## Checks and Adjustments After Adjustment

### 12. Video Tracking Check

Refer to section 5-2.

### 13. CUE Head Height Check

Refer to section 5-5.

### 14. CUE Head Azimuth Adjustment

Refer to section 5-6.

### 15. CUE Head Height Check

Refer to section 5-5.

### 16. CTL Head Position Check

Refer to section 5-4.

### 17. CUE/TC Head Position Check

Refer to section 5-8.

## 5-2. Video Tracking Adjustment

### Notes

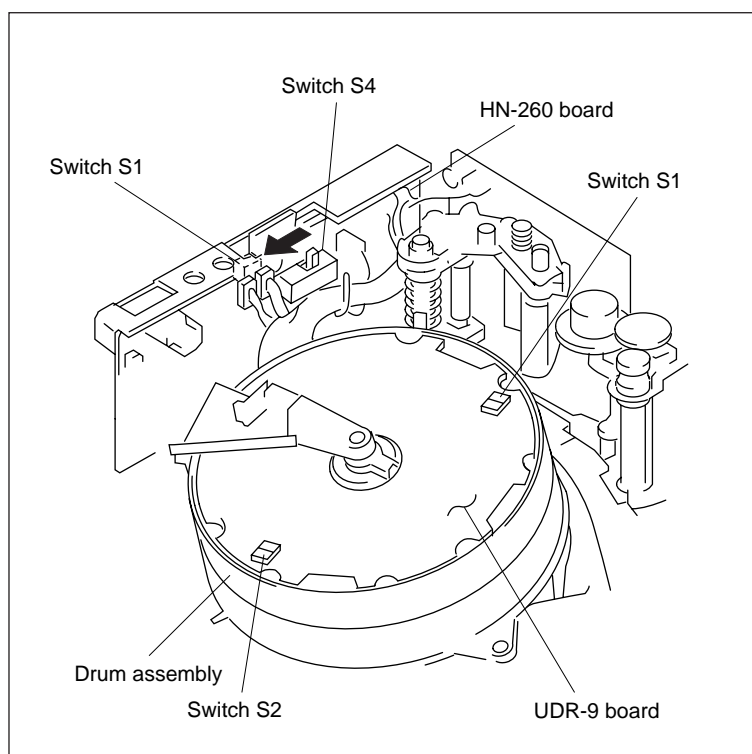
- Tighten the screws at the top of the tape guides to the following tightening torque.  
 $9 \times 10^{-2} \text{N} \cdot \text{m}$  (0.9 kgf•cm)
- After this adjustment, be sure to check the tape running adjustment.  
 After checking, put a locking compound to the screws at the top of each tape guide.

### Tools

- Tape guide adjustment screwdriver (45) : J-6322-420-B
- Inspection mirror : J-6080-840-A
- TP tool : J-6420-910-A
- Alignment tape, ZR2-1 (NTSC) : 8-960-073-11
- Alignment tape, ZR2-1P (PAL) : 8-960-073-61
- Oscilloscope

### Setting

1. Turn the power off.
2. Connect the 8-pin connector of the TP tool to the connector CN7 on the HN-260 board.
3. Connect the 5-pin connector of the TP tool to the connector CN3 on the CTL-10 board.
4. Set the all four switches of switches S1 and S2 on the UDR-9 board which is attached to the upper drum to TEST (ON).
5. Set the switch S4 on the HN-260 board to TEST.
6. Disconnect the connector that comes from the slip ring and connect the connector of the harness to CN9 on the HN-260 board.
7. Set the switches S1-1 and S1-2 on the HN-260 board to OFF.
8. Connect an oscilloscope.  
 CH-1 : REC RF A/TP tool  
 CH-2 : REC RF E/TP tool  
 TRIG : SV REF CF/TP tool
9. Turn the power on.
10. Insert the alignment tape cassette ZR2-1P.



## Checks

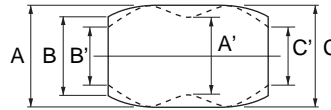
### 1. PLAY Mode

- (1) Set the switch S1-2 on the HN-260 board to ON.  
The tracking control becomes operable with this setting.
- (2) Play back the ZR2-1/P (from 00 minute to 15 minute segment).
- (3) When turning the tracking control (RV1) on the HN-260 board, check that the amplitude of the RF signal of the entrance and exit sides are smaller than the output level at the center. If the RF signal amplitude is bigger than that of center, perform step 5 and higher (drum entrance side or drum exit side).
- (4) Turn the tracing control (RV1) and check that the RF waveform is 80% of the maximum output amplitude. Check that the RF waveform satisfies the specifications 1.  
If the specification is not satisfied, perform step 3 and higher (drum entrance side or drum exit side).

### 2. RF Waveform Check

- (1) When moving the unit from horizontal position to vertical position, the RF waveform satisfies the specifications 1.  
If the specification is not satisfied, perform step 3 and higher (drum entrance side or drum exit side).
- (2) When the unit returns the horizontal position and repeat the mode change from the EJECT mode to PLAY mode 2 or 3 times, check that the RF waveform during PLAY mode is the same as the pre-PLAY mode, and satisfies the specifications 1. If the RF waveform is changed or the specification is not satisfied, perform step 3 and higher (drum entrance side or drum exit side).
- (3) When repeat the mode change from the REV search mode o PLAY mode 2 or 3 times, check that the RF waveform during PLAY mode, and satisfies the specifications 1.  
If the RF waveform is changed or the specification is not satisfied, perform step 3 and higher (drum entrance side or drum exit side).

#### <PLAY Mode>



Spec1.:  $\frac{B}{A} \times 100 \geq 80\%$  (Drum at entrance side)  
 $\frac{C}{A} \times 100 \geq 80\%$  (Drum at exit side)  
 $\frac{B'}{B} \times 100 \geq 90\%$  (Flucuation at drum entrance side)  
 $\frac{C'}{C} \times 100 \geq 90\%$  (Fluctuation at drum exit side)  
 $\frac{A'}{A} \times 100 \geq 90\%$  (Fluctuation at drum center)

**REV search mode**

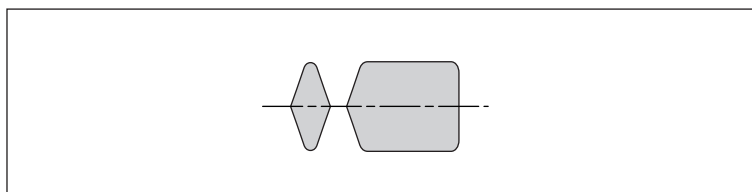
Press the REW button after pressing the PLAY mode.  
(The PLAY and REW buttons on the keyboard light up.)

- (4) When repeating the mode change from the STOP mode to PLAY mode 2 or 3 times, check that the RF waveform during PLAY mode is the same as the pre-PLAY mode, and satisfies the specifications 1. If the RF waveform is changed or the specification is not satisfied, perform step 3 and higher (drum entrance side or drum exit side).

---

**Adjustments****Drum entrance side****3. Tracking Adjustment of Drum Entrance Side**

- (1) Play back ZR2-1/P (from 00 minute to 15 minute segment).
- (2) Loosen the set screw at the top of the S2 guide using the tape guide adjustment screwdriver.
- (3) Turn the upper flange of the S2 guide counterclockwise using the tape guide adjustment screwdriver so that the 1.5 peaks are observed on scope as shown.  
Check that the clearance exists between lower flange of the tension regulator and S5 guides, and lower edge of the tape.  
If no clearance exists, adjust height of the tension regulator and S5 guides.
- (4) Check that no clearance exists between upper flange of the S2 guide and upper edge of the tape.
- (5) Turn the upper flange of the S2 guide clockwise so that the RF waveform becomes almost flat.
- (6) Set the switch S1-2 on the HN-260 board to ON. This setting enables the tracking control adjustment.
- (7) Play back ZR2-1/P. (from 00 minute to 15 minute segment).
- (8) Turn the tracking control so that the RF waveform is 80% of the maximum output level.
- (9) Turn the upper flange of the S2 guide and fine-adjust height of the S2 guide so that the RF waveform is flat and satisfies the specifications 1.
- (10) Tighten the set screw at the top of the S2 guide.
- (11) Loosen the set screw at the upper flange of the S5 guide. Turn and adjust the upper flange so that there must be a clearance between the top edge of the tape and the upper flange, and a clearance between the bottom edge of the tape and the lower flange.
- (12) Tighten the set screw at the top of the S5 guide.



#### 4. Video Tracking Re-check

Perform the steps 1 and 2 of the check procedures and re-check the video tracking.

#### 5. Tape Running Check

Check the tape running condition (drum entrance side) according to section 5-1.

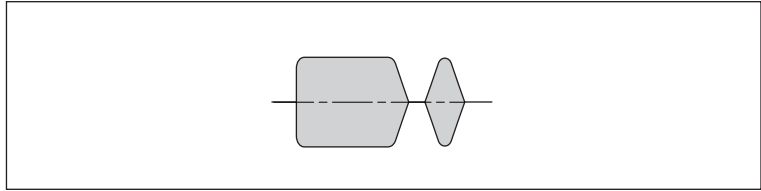
##### Note

After adjustment, be sure to set the switch S1-2 on the HN-260 board to the OFF.

#### Drum exit side

#### 6. Tracking Adjustment Drum Exit Side

- (1) Play back ZR2-1/P (from 00 minute to 15 minute segment).
- (2) Loosen the set screw at the top of the T2 guide using the tape guide adjustment screwdriver.
- (3) Turn the upper flange of the T2 guide counterclockwise using the tape guide adjustment screwdriver so that the RF waveform 1.5 peaks are observed on scope. Check that the clearance exists between lower flange of the T3 guide and lower edge of the tape. If no clearance exists, adjust height of the T3 guide.
- (4) Check that no clearance exists between upper flange of the T2 guide and upper edge of the tape.
- (5) Turn the upper flange of the T2 guide clockwise so that the RF waveform becomes almost flat.
- (6) Set the switch S1-2 on the HN-260 board to ON. This setting enables the tracking control adjustment.
- (7) Play back ZR2-1/P (from 00 minute to 50 minute segment).
- (8) Turn the tracking control so that the RF waveform is 80% of the maximum output level.
- (9) Turn the upper flange of the T2 guide and fine-adjust height of the T2 guide so that the RF waveform is flat and satisfies the specifications 1.
- (10) Tighten the set screw at the top of the T2 guide.
- (11) Loosen the set screw at the upper flange of the T3 guide. Turn and adjust the upper flange so that the tape runs not while maintaining contact with the upper and lower flanges.
- (12) Tighten the set screw at the top of the T3 guide.





**7. Video Tracking Re-check**

Perform the steps 1 and 2 of the check procedures and re-check the video tracking.

**8. Tape Running Check**

Check the tape running condition (drum exit side) according to section 5-1.

**Note**

After adjustment, be sure to select the switch S1-2 on the HN-260 board to the OFF.

---

**Checks and Adjustments After Adjustment****9. CTL Head Height Check**

Refer to section 5-3.

**10. CUE Head Height Check**

Refer to section 5-5.

**11. CUE Head Azimuth Adjustment**

Refer to section 5-6.

**12. CUE Head Height Check**

Refer to section 5-5.

**13. CTL Head Position Adjustment**

Refer to section 5-4.

**14. CUE/TC Head Position Adjustment**

Refer to section 5-8.

**15. Automatic Servo Adjustment**

Refer to section 6-3-1.

## 5-3. CTL Head Height Adjustment

### Tools

- TP tool : J-6420-910-A
- Alignment tape, ZR2-1 (NTSC) : 8-960-073-11
- Alignment tape, ZR2-1P (PAL) : 8-960-073-61
- Box screwdriver
- Oscilloscope

### Setting

1. Turn the power on.
2. Connect the 8-pin connector of the TP tool to the connector CN7 on the HN-260 board.
3. Connect the 5-pin connector of the TP tool to the connector CN3 on the CTL-10 board.
4. Set the switches S1-1 and S1-2 on the HN-260 board to OFF.
5. Connect an oscilloscope.  
CH-1: PB CTL/TP tool  
TRIG: SV REF CF/TP tool
6. Turn the power on.
7. Insert the alignment tape ZR2-1/P.

## Checks

### 1. Play Back

Play back ZR2-1/P.

### 2. CTL Head Height Check

- (1) When pressing down the portion A of the tape shown in the figure, check that the level decreases.

If the level increases, perform step 3.

- (2) When pushing up the portion B, check that the level decreases.

If the level increases, perform step 4.

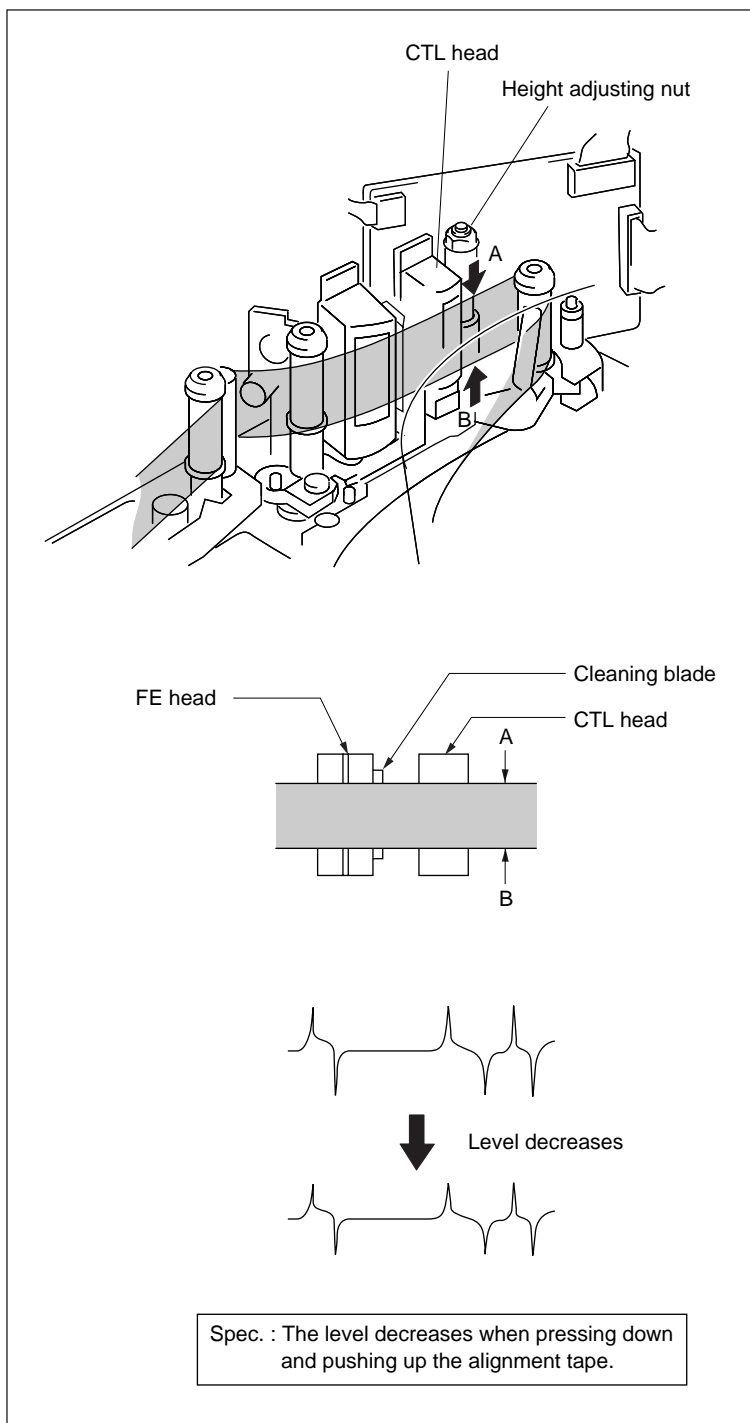
## Adjustments

### 3. If the Level Increases When Pressing Down the Tape

Turn the height adjusting nut counterclockwise, and adjust so that the output waveform is the maximum.

### 4. If the Level Increases When Pushing Up the Tape

Turn the height adjusting nut clockwise, and adjust so that the output waveform is the maximum.



## Adjustments After Adjustment

### 5. CTL Head Position Adjustment

Refer to section 5-4.

### 6. CUE/TC Head Position Adjustment

Refer to section 5-8.

### 7. Automatic Servo Adjustment

Refer to section 6-3-1.

## 5-4. CTL Head Position Adjustment

### Notes

- The CTL head position adjustment is closely related to the CUE/TC head position adjustment.
- After carrying out the CTL head position adjustment, be sure to carry out the CUE/TC head position check.

### Tools

- TP tool : J-6420-910-A
- Alignment tape, ZR2-1 (NTSC) : 8-960-073-11
- Alignment tape, ZR2-1P (PAL) : 8-960-073-61
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- Oscilloscope

### Setting

1. Turn the power off.
2. Connect the 8-pin connector of the TP tool to the connector CN7 on the HN-260 board.
3. Connect the 5-pin connector of the TP tool to the connector CN3 on the CTL-10 board.
4. Set the switches S1-1 and S1-2 on the HN-260 board to OFF.
5. Connect an oscilloscope.
  - CH-1 : REC RF A/TP tool
  - CH-2 : PB CTL/TP tool
  - TRG : SV REF CF/TP tool
6. Turn the power on.
7. Insert the alignment tape ZR2-1/P.

## Checks

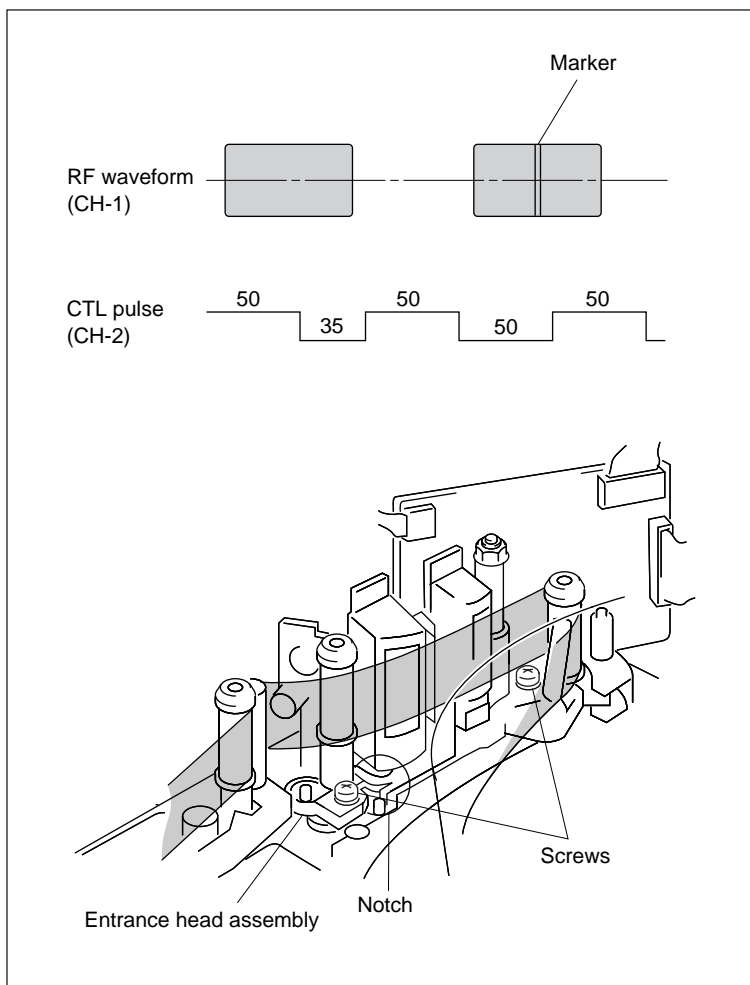
### 1. Play Back

Play back ZR2-1/P (from 00 minute to 15 minute segment).

### 2. CTL Head Position Check

- (1) Set the switch S1-2 on the HN-260 board to ON.  
The tracking control becomes operable with this setting.
- (2) Turn the tracking control (RV1) on the HN-260 board so that the output level at the center of the RF waveform is the maximum. Check that the marker of the RF waveform is output in the low level of the CTL PULSE.
- (3) Set the switch S1-2 on the HN-260 board to OFF and put the tracking control into the FIX state.
- (4) Check that the output level of the RF waveform with the marker is not changed and is the same as the level of the step (2).

If the specification is not satisfied, perform step 3.



## Adjustments

### 3. CTL Head Position Adjustment

- (1) Turn the two screws which secure the entrance head assembly 1/4 to 1/2 turn.
- (2) Put the (–) 3 mm screwdriver in the notch of the entrance head assembly.
- (3) Turn the screwdriver and adjust the CTL head position so that the marker of the RF waveform is output in the low level of the CTL PULSE, and the output level at the center of the RF waveform is the maximum.
- (4) While holding the screwdriver in step (3), tighten the two screws.

### 4. CTL Head Position Re-check

Re-check the CTL head position according steps 1 and 2.

## Adjustment After Adjustment

### 5. CUE/TC Head Position Adjustment

Refer to section 5-8.

## 5-5. CUE Head Height Adjustment

### Notes

- The CUE head height adjustment is closely related to the azimuth, zenith and position adjustments of the CUE head.
- After carrying out the CUE head height adjustment, be sure to carry out the other adjustments or checks of the CUE head.

### Tools

- Alignment tape, ZR2-1 (NTSC) : 8-960-073-11
- Alignment tape, ZR2-1P (PAL) : 8-960-073-61
- TP tool : J-6420-910-A
- Box screwdriver
- Oscilloscope

### Setting

1. Turn the power off.
2. Connect the 8-pin connector of the TP tool to the connector CN7 on the HN-260 board.
3. Connect the 5-pin connector of the TP tool to the connector CN3 on the CTL-10 board.
4. Select the switches S1-1 and S1-2 on the HN-260 board to the OFF.
5. Connect an oscilloscope.  
CH-1 : PB CUE/TP tool
6. Turn the power on.
7. Insert the alignment tape ZR2-1/P.

## Checks

### 1. Play Back

Play back ZR2-1/P (from 00 minute to 15 minute segment).

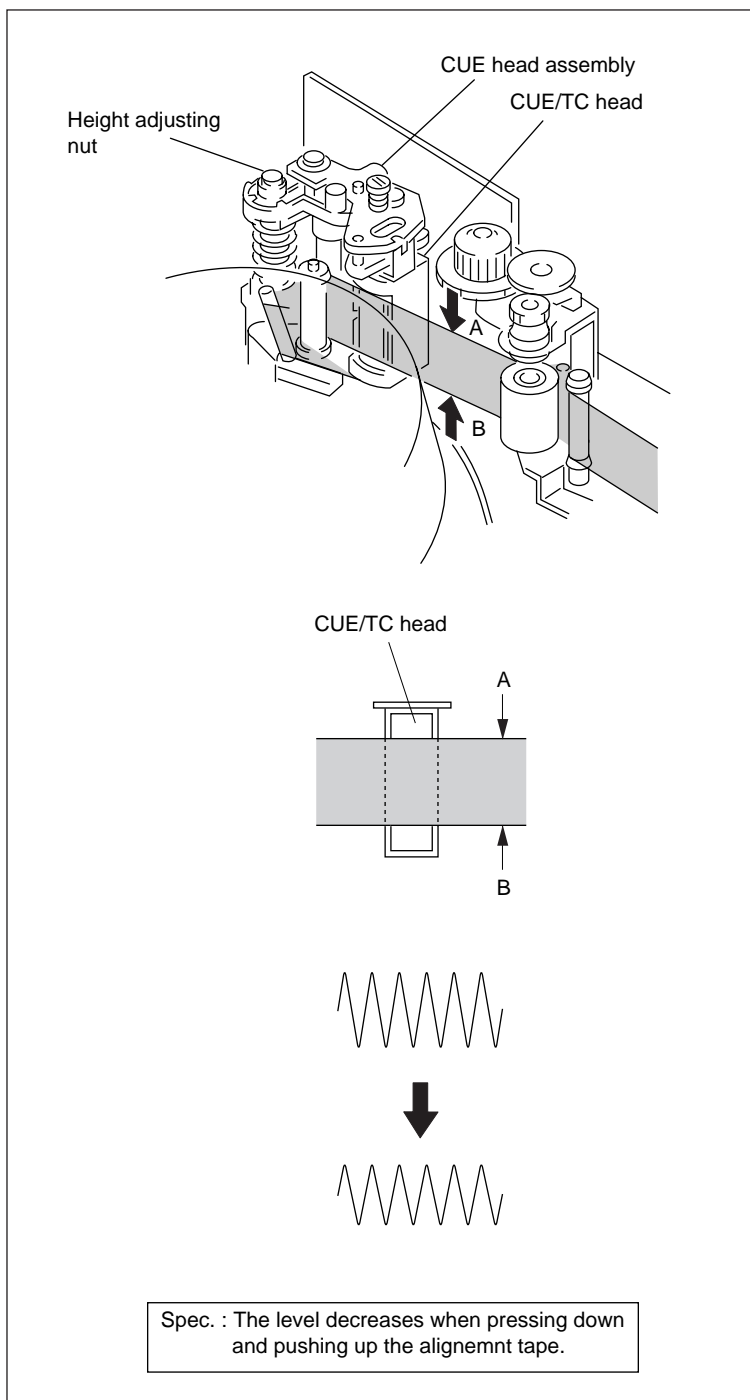
### 2. CUE Head Height Check

- (1) When pressing down the portion A of the tape shown in the figure, check that the level decreases.  
If the level increases, perform step 3.
- (2) When pushing up the portion B, check that the level decreases.  
If the level increases, perform step 3.
- (3) Repeat the mode change from EJECT mode to PLAY mode 2 or 3 times. Check that the output level is the same as the pre-PLAY level and is not changed.  
If the level is changed, perform step 3.
- (4) Repeat the mode change from REV search mode to PLAY mode 2 or 3 times. Check that the output level is the same as the pre-PLAY level and is not changed.  
If the level is changed, perform the step 3.

### REV search mode

Press the REW button after pressing the PLAY button.

(The PLAY and REW buttons on the keyboard light up.)



---

## Adjustments

### 3. CUE Head Height Adjustments

- If the level increases when pressing down the tape.  
Turn the height adjusting nut counterclockwise and adjust so that the output waveform is the maximum.
- If level increases when pushing up the tape.  
Turn the height adjusting nut clockwise and adjust so that the output waveform is the maximum.

### 4. CUE Head Azimuth Adjustment

Refer to section 5-6.

### 5. CUE Head Head-to-contact Check

Refer to section 5-7.

### 6. CUE/TC Head Position Check

Refer to section 5-8.

### 7. CUE Head Height Check

Re-check according to the step 2.



## 5-6. CUE Head Azimuth Check

### Notes

- The check whether the CUE head azimuth is correctly adjusted or not is extremely difficult from the point of the tape running system.  
Do not perform this check, but adjust the CUE head azimuth according to the following procedures.
- The CUE head azimuth check the position and height adjustments of the CUE head.
- After carrying out the CUE head azimuth adjustment, be sure to carry out the adjustments or checks of the CUE head.

### Tools

- Alignment tape, ZR2-1 (NTSC) : 8-960-073-11
- Alignment tape, ZR2-1P (PAL) : 8-960-073-61
- TP tool : J-6420-910-A
- Oscilloscope

### Setting

1. Turn the power off.
2. Connect the 8-pin connector of the TP tool to the connector CN7 on the HN-260 board.
3. Connect the 5-pin connector of the TP tool to the connector CN3 on the CTL-10 board.
4. Set the switches S1-1 and S1-2 on the HN-260 board to OFF.
5. Connect an oscilloscope.  
CH-1: PB CUE/TP tool
6. Turn the power on.
7. Insert the alignment tape ZR2-1/P.

## Checks

### 1. Play Back

Play back ZR2-1/P (from 15 minute to 25 minute segment).

### 2. CUE Head Azimuth Check

- (1) Turn the azimuth adjusting screw clockwise or counterclockwise so that the output waveform is the maximum.
- (2) Repeat the mode change from the EJECT mode to PLAY mode 2 or 3 times. Check that the output level is the same as the level in the step (1) and is not changed.
- (3) Repeat the mode change from the REV mode to PLAY mode 2 or 3 times. Check that the output level is the same as the level in the step (1) and is not changed.

### REV search mode

Press the REW button after pressing the PLAY button. (The PLAY and REW buttons on the keyboard light up.)

### 3. CUE Head Head-to-tape Contact Adjustment

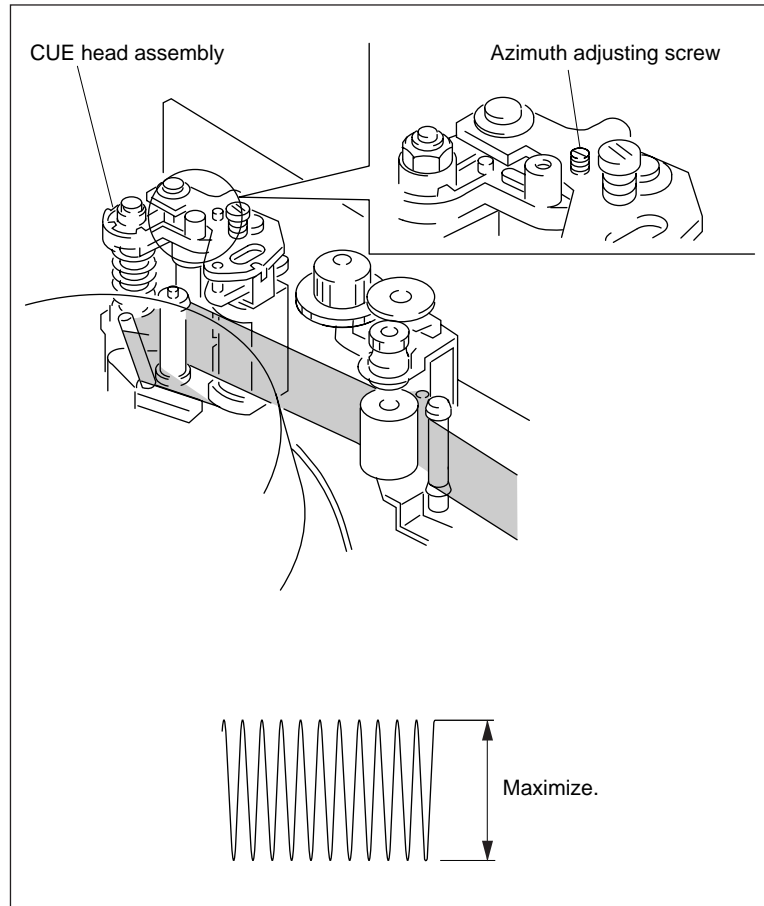
Refer to section 5-7.

### 4. CUE Head Height Check

Refer to section 5-5.

### 5. CUE/TC Head Position Check

Refer to section 5-8.



## 5-7. CUE Head Head-to-tape Contact Adjustment

### Notes

- The CUE head head-to-tape contact adjustment is closely related to the height, azimuth and position adjustments of the CUE head.
- After carry out the CUE head head-to-tape contact adjustment, be sure to carry out the adjustments or checks of the CUE head.

### Tools

- Alignment tape, ZR2-1 (NTSC) : 8-960-073-11
- Alignment tape, ZR2-1P (PAL) : 8-960-073-61
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- TP tool : J-6420-910-A
- Oscilloscope

### Setting

1. Turn the power off.
2. Connect the 8-pin connector of the TP tool to the connector CN7 on the HN-260 board.
3. Connect the 5-pin connector of the TP tool to the connector CN3 on the CTL-10 board.
4. Select the switches S1-1 and S1-2 on the HN-260 board to the OFF.
5. Connect an oscilloscope.  
CH-1: PB CUE/TP tool  
TRIG: CH-1
6. Turn the power on.
7. Insert the alignment tape ZR2-1/P.

## Checks

### 1. Play Back

Play back ZR2-1/P (from 15 minute to 25 minute segment).

### 2. CUE Head Head-to-tape Contact Check

- (1) Press lightly the portions A and B of the tape shown in the figure.
- (2) Check that the increase quantity of the output level satisfies the specification.

Specification : The increase quantity of the output level is within 5%.

If the specification is not satisfied, perform step 3 and higher.

## Adjustments

### 3. CUE Head Head-to-tape Contact Adjustment

- (1) Loosen the two head installing screws 1/4 to 1/2 turn.
- (2) Put the (−2) mm screwdriver in the notch of the head swing adjusting plate.
- (3) Turn the screwdriver and adjust the CUE head position so that the output level is the maximum.
- (4) While keeping the state of the screwdriver in the step (3), tighten the two screws.

### 4. CUE Head Head-to-tape Contact Re-check

Re-check according the steps 1 and 2.

### 5. CUE Head Azimuth Adjustment

Refer to section 5-6.

### 6. CUE Head Head-to-tape Contact Check

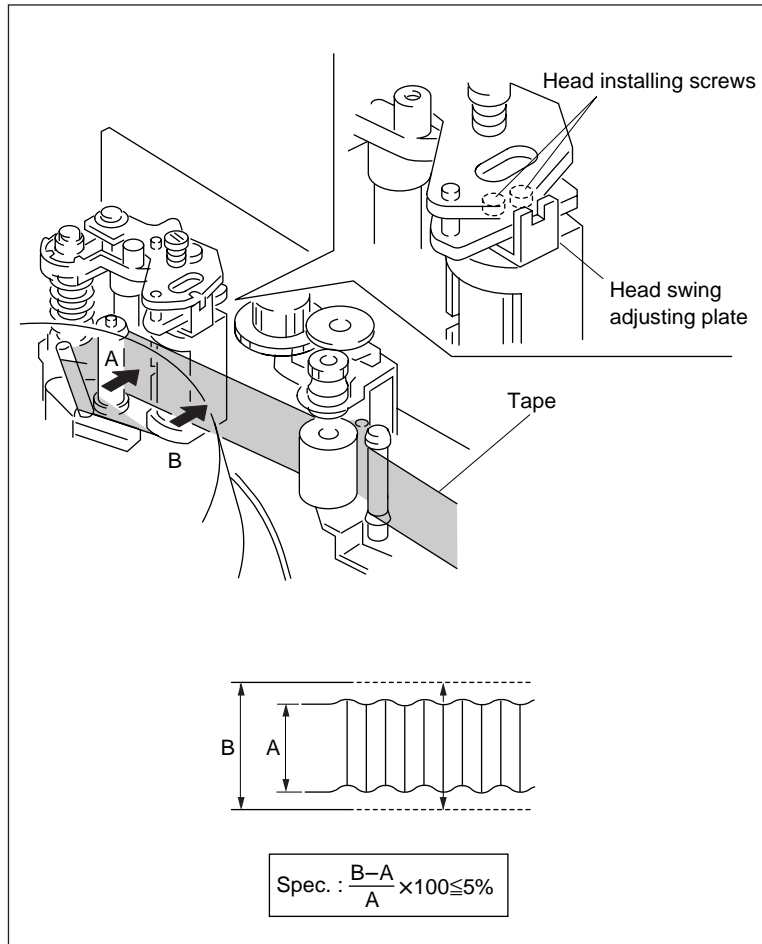
Refer to section 5-7.

### 7. CUE Head Height Check

Refer to section 5-5.

### 8. CUE/TC Head Position Adjustment

Refer to section 5-8.



## 5-8. CUE/TC Head Position Adjustment

### Notes

- Before this adjustment, be sure to finish the CTL head position adjustment. The CUE/TC head position adjustment is performed as the standard position of the CTL head.
- The CUE/TC head position adjustment closely related to the height, azimuth and head-to-tape contact adjustments of the CUE head. After CUE/TC head position adjustment, be sure to perform the adjustments or checks of the CUE head.

### Tools

- Alignment tape, ZR2-1 (NTSC) : 8-960-073-11
- Alignment tape, ZR2-1P (PAL) : 8-960-073-61
- Torque screwdriver bit (for M2) : J-6325-380-A
- Torque screwdriver (for 3 kg) : J-6325-400-A
- TP tool : J-6420-910-A
- Oscilloscope

### Setting

1. Turn the power off.
2. Connect the 8-pin connector of the TP tool to the connector CN-7 on the HN-260 board.
3. Connect the 5-pin connector of the TP tool to the connector CN-3 on the CTL-10 board.
4. Set the switches S1-1 and S1-2 on the HN-260 board to OFF.
5. Connect an oscilloscope.
  - CH-1 : SHAPED CTL/TP tool
  - CH-2 : TC/TP tool
  - TRIG : SV REF CF/TP tool
6. Turn the power on.
7. Insert the alignment tape ZR2-1/P.

## Adjustments

### 1. Play Back

Play back ZR2-1/P (from 00 minute to 15 minute segment).

### 2. CUE/TC Head Position Check

- (1) Check that the positional relation of the falling edge of the CTL pulse, and the rising edge of the TC signal satisfy the specification.

If the specification is not satisfied, perform step 3 and higher.

- (2) Repeat the mode change from EJECT mode to PLAY mode 2 or 3 times. Check that the specification is satisfied.

If the specification is not satisfied, perform step 3 and higher.

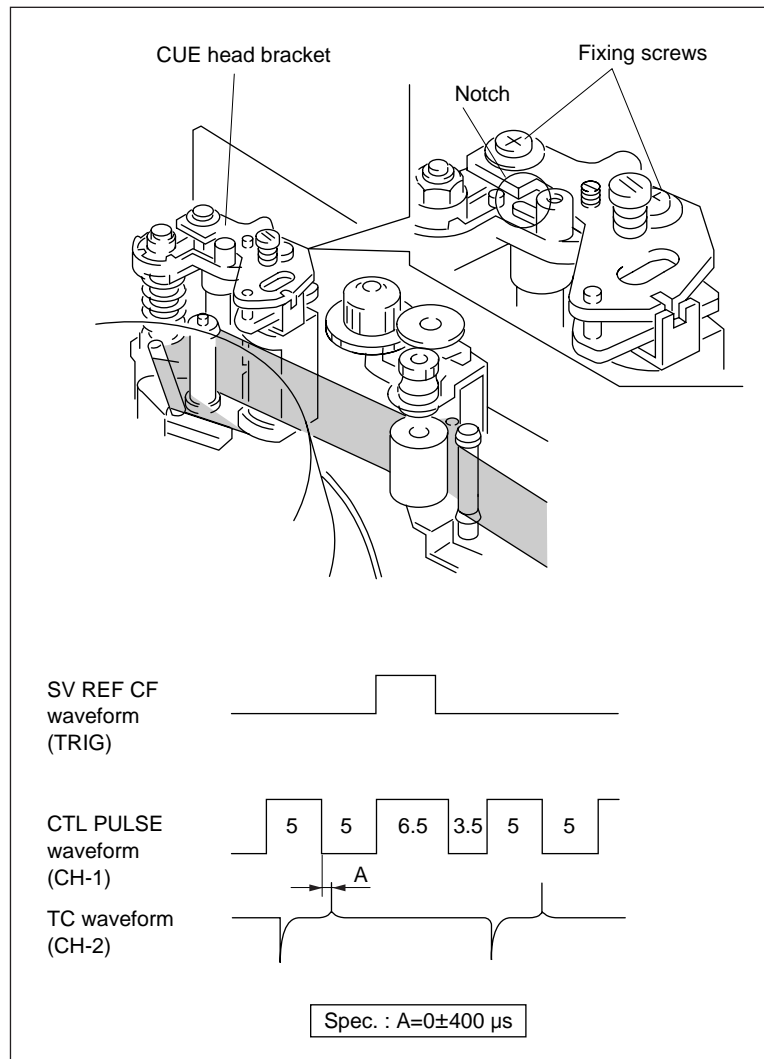
- (3) Repeat the mode change from REV mode to PLAY mode 2 or 3 times. Check that the specification is satisfied.

If the specification is not satisfied, perform step 3 and higher.

### REV search mode

Press the REW button after pressing the PLAY button.

(The PLAY and REW buttons on the keyboard light up.)



## Adjustment

### 3. CUE/TC Head Position Adjustment

- (1) Loosen the screws of the CUE head bracket 1/4 to 1/2 turn.
- (2) Put the (–) 3 mm screwdriver in the notch of the CUE head bracket.
- (3) Turn the screwdriver and adjust the CUE/TC head position so that the specification is satisfied.
- (4) While keeping the state of the screwdriver in the step (3), tighten the two screws.

### 4. CUE/TC Head Position Re-check

Re-check the according to the steps 1 and 2.

**5. CUE Head Azimuth Adjustment**

Refer to section 5-6.

**6. CUE Head Head-to-tape Contact Check**

Refer to section 5-7.

**7. CUE Head Height Check**

Refer to section 5-5.

**8. CUE/TC Head Position Re-check**

Re-check according to the steps 1 and 2.

## 5-9. CUE Output Level Check

### Tools

- Alignment tape, ZR2-1 (NTSC) : 8-960-073-11
- Alignment tape, ZR2-1P (PAL) : 8-960-073-61
- TP tool : J-6420-910-A
- Oscilloscope

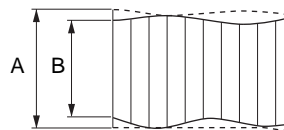
### Setting

1. Turn the power off.
2. Connect the 8-pin connector of the TP tool to the connector CN7 on the HN-260 board.
3. Connect the 5-pin connector of the TP tool to the connector CN3 on the CTL-10 board.
4. Select the switches S1-1 and S1-2 on the HN-260 board to the OFF.
5. Connect an oscilloscope.  
CH-1 : PB CUE/TP tool  
TRIG : CH-1
6. Turn the power on.
7. Insert the alignment tape ZR2-1/P.

### Check

#### 1. CUE Output Level Check

- (1) Play back ZR2-1/P (from 15 minute to 25 minute segment).
- (2) Check that the fluctuation of the CUE output level satisfies specification 1.
- (3) Set the dip switch S1-1 on the HN-260 board to ON.
- (4) Press the switch S3 on the HN-260 board 10 times.  
(The Nos.1 and 3 of the MODE display LEDs light up.)
- (5) Play back ZR2-1/P (from 00 minute to 15 minute segment).
- (6) Make a memo of the CUE output level. (This level is as the C.)
- (7) Press the REW button and enter the REV state.
- (8) Check that the CUE output level (this level is as the D.) satisfies specification 2.
- (9) After checking, set the dip switch S1-1 on the HN-260 board to OFF.



|         |   |
|---------|---|
| Spec.1: | $\frac{A-B}{A} \times 100 \leq 8\%$ (Fluctuation) |
| Spec.2: | $\frac{D}{C} \times 100 \geq 70\%$                |



## Section 6

### VTR System Alignment

#### 6-1. Preparation

##### Measuring equipment

- Color monitor  
Sony BVM-1410/1410P or equivalent
- Digital voltmeter  
Advantest TR6845 or equivalent
- Regulated DC power supply
- Standard player
- Audio analyzer  
Tektronix AA501A (OP.02) or equivalent
- Signal generator  
Tektronix SG5010 or equivalent

##### Tools and fixtures

- Alignment tape (ZR5-1 for NTSC, ZR5-1P for PAL)  
Sony part No. : 8-960-073-01 for ZR5-1  
8-960-073-51 for ZR5-1P
- Alignment tape (ZR2-1 for NTSC, ZR2-1P for PAL)  
Sony part No. : 8-960-073-11 for ZR2-1  
8-960-073-61 for ZR2-1P
- Work tape (Cassette tape that can be erased\*1)  
Digital betacam cassette (BCT-D40)
- TP tool (for tape path adjustment)  
Sony part No. : J-6420-910-A

\*1 : A work tape that is not used so many times is desired.  
The already recorded tape can be used. However, note that the previous signals will be erased during adjustment.

##### Precautions

Before starting adjustment of this section, check the product destination that is indicated on the TC-101 and DVP-17 boards and the setting of the model selection switches on the same boards. (Refer to Maintenance Manual Part 1, Section 1 “1-10. Switch/Slit Land Settings on the Boards”.)

##### Initial setting of the switches

[Inside panel]

|                           |            |
|---------------------------|------------|
| VTR SAVE/STBY switch      | → STBY     |
| GAIN switch               | → L (0 dB) |
| OUTPUT/DCC switch         | → BARS     |
| WHITE BAL switch          | → PRST     |
| AUDIO IN CH-1 switch      | → REAR     |
| AUDIO IN CH-2 switch      | → REAR     |
| AUDIO SELECT CH-1 switch  | → AUTO     |
| AUDIO SELECT CH-2 switch  | → AUTO     |
| PRESET/REGEN/CLOCK switch | → PRESET   |
| F-RUN/SET/R-RUN switch    | → R-RUN    |
| DATA DISPLAY switch       | → U-BIT    |
| DISPLAY switch            | → TC       |

[Rear panel]

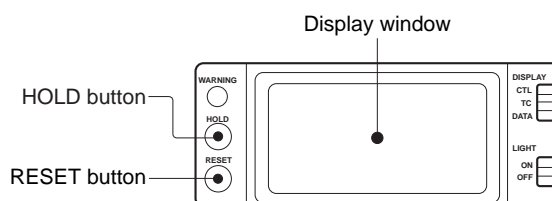
|                               |        |
|-------------------------------|--------|
| AUDIO IN CH-1 LINE/MIC switch | → LINE |
| AUDIO IN CH-2 LINE/MIC switch | → LINE |

##### How to start the adjustment mode

To enter the adjustment mode in order to perform the adjustments described in this section, do the following.

1. While pressing the RESET button (inside panel), turn off the POWER switch.
2. While pressing the HOLD button (inside panel), turn the POWER switch back on.

When the display window appears, release the HOLD button.



##### How to exit from the adjustment mode

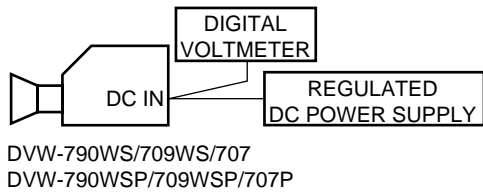
1. Turn the POWER to OFF/ON.

## 6-2. Power System Adjustment

### 6-2-1. Battery End Detection Voltage Adjustment

#### Preparation

- Connect as follows.



- Supply +12 V DC to the DC IN connector.

#### Adjustment Procedure

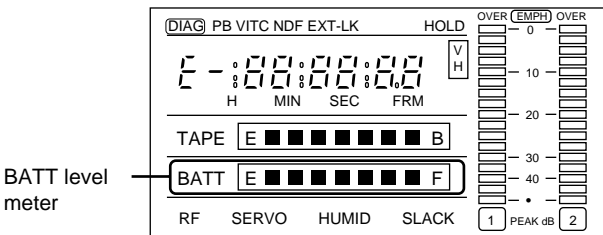
- Insert a work tape\*<sup>1</sup> (BCT-D40) and enter the recording mode.

\*1 : A work tape that is not used so many times is desired.  
The already recorded tape can be used. However, note that the previous signals will be erased during adjustment.

- Measurement point : DC IN connector  
Adjust the output voltage of the external regulated DC power supply until the following specification is satisfied:  
Spec. :  $11.28 \pm 0.02$  V DC
- Press the DIAG button (inside panel) to enter the DIAG menu.
- Keep pressing the HOLD button (inside panel) and confirm that the WARNING indicator turns on momentarily.  
If not, repeat the adjustment from step 1.

#### Check Procedure

- Enter the STOP mode.
- Turn the POWER switch off and back on.
- Enter the REC mode.
- Measurement point : DC IN connector  
Adjust the output voltage of the external regulated DC power supply until the following specification is satisfied:  
Spec. :  $11.28 \pm 0.02$  V DC
- Check the display window.  
BATT level meter : The three indicators on the left turn on.
- Increase the output voltage of the external regulated DC power supply gradually until seven indicators (FULL) of the BATT level meter turn on. Measure the output voltage of the external regulated DC power and confirm that the following specification is now satisfied:  
Spec. :  $11.98 \pm 0.02$  V



Display window

## 6-3. Servo System Adjustment

### 6-3-1. Automatic Servo Adjustment

#### Preparation

- SI-1 (HN-260 board) → ON (Default setting: OFF)
- SI-2 (HN-260 board) → OFF (Default setting: OFF)

#### Adjustment Procedure

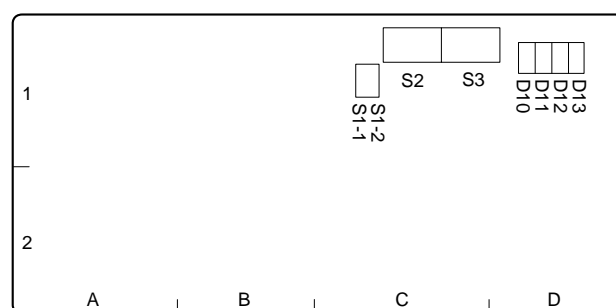
1. Insert a work tape\*<sup>1</sup> (BCT-D40).

\*1 : A work tape that is not used so many times is desired.  
The already recorded tape can be used. However, note that the previous signals will be erased during adjustment.

2. Run the tape in the fast forward mode until the remaining tape amount indicator on the VF shows “20-15”.
3. Check that D10 to D13 of the HN-260 board are turned off.
4. Press the S3 button once to turn on D10 only.
5. Press the S2 button for a second or longer, then release it to enter and execute the automatic adjustment mode.  
(It takes about a minute to complete the automatic adjustment.)
  - Capstan FG duty ratio adjustment
  - Capstan free run speed adjustment
  - REC-PAUSE recording delay adjustment (REC, REC-PAUSE)
6. When the adjustment has ended successfully, the tape is automatically ejected.  
(Turn off the main power 10 seconds or later after completion of the adjustment.)  
If the adjustment failed, repeat the adjustment starting again from step 1.

#### Setting upon Completion of Adjustment

- S1-1 (HN-260 board) → OFF
- S1-2 (HN-260 board) → OFF



### 6-3-2. Automatic PG Phase Adjustment

#### Preparation

- S1-1, S1-2 (UDR-9 board) → TEST (ON) (Default setting : REC (OFF))
- S2-1, S2-2 (UDR-9 board) → TEST (ON) (Default setting : REC (OFF))
- S4 (HN-260 board) → TEST (Default setting : REC )
- S1-1 (HN-260 board) → ON (Default setting : OFF)
- S1-2 (HN-260 board) → OFF (Default setting : OFF)
- Remove the connector that is connected to the slip ring.  
Connect the connector of the harness end to the CN9 connector of the HN-260 board.

#### Adjustment Procedure

1. Turn on the power switch.
2. **RV1** (HN-260 board) → Turn it fully clockwise. (MIN)
3. Press S3 (HN-260 board) twice (within a second/pressing). Check that D11 (HN-260 board) turns on.
4. Insert the alignment tape (ZR2-1/1P) and reproduce the 4 MHz signal (TIME : 00 : 00 : 00 to 14 : 59 : 29).

#### Note

Do not reproduce the 15 minute segment and later of the ZR2-1/1P alignment tape.

5. Press S2 (HN-260 board) for one second and longer, and remove your hand from S2. The automatic PG phase adjustment mode starts. (The automatic PG phase adjustment takes several seconds.)
  - PG phase adjustment
6. When the automatic PG phase adjustment ends with success, the alignment tape is automatically ejected. (Wait another 10 seconds or longer before turning off the main power.)  
When the automatic PG phase adjustment ends with fail, the VTR enters the STOP mode. Then repeat the automatic PG phase adjustment from step 1 to step 3 once again. If the automatic PG phase adjustment still ends with fail, perform the MANUAL PG phase adjustment as described in the subsequent paragraph. (Refer to Section 6-3-3.)

#### Setting upon Completion of Adjustment

- S1-1, S1-2 (UDR-9 board) → REC (OFF)
- S2-1, S2-2 (UDR-9 board) → REC (OFF)
- S4 (HN-260 board) → REC
- S1-1 (HN-260 board) → OFF
- S1-2 (HN-260 board) → OFF
- Re-connect the connectors to the original connections.

### 6-3-3. MANUAL PG Phase Adjustment

#### Note

Perform the MANUAL PG Phase Adjustment only when Section “6-3-2. Automatic PG Phase Adjustment” does not end with success by all means.

#### Preparation

- S1-1, S1-2 (UDR-9 board) → TEST (ON) (Default setting : REC (OFF))
- S2-1, S2-2 (UDR-9 board) → TEST (ON) (Default setting : REC (OFF))
- S4 (HN-260 board) → TEST (Default setting : REC )
- S1-1 (HN-260 board) → ON (Default setting : OFF)
- S1-2 (HN-260 board) → OFF (Default setting : OFF)
- Connect the 8-pin connector of the TP tool for tape path adjustment to CN7 connector on the HN-260 board.
- Connect the 5-pin connector of the TP tool for tape path adjustment to CN3 connector on the CTL-10 board.
- Remove the connector that is connected to the slip ring. Connect the connector of the harness end to the CN9 connector of the HN-260 board.
- Connect an oscilloscope to the TP tool as follows:  
CH-1 : RECRF A  
CH-2 : PGADJREF  
TRIG : RECRFCF

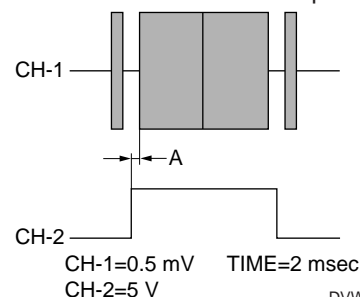
#### Adjustment Procedure

1. Turn on the power switch.
2. Press S3 (HN-260 board) twice (within a second/pressing). Check that D11 (HN-260 board) turns on.
3. Insert the alignment tape (ZR2-1/1P) and reproduce the 4 MHz signal (TIME: 00:00:00 to 14:59:29).

#### Note

Do not reproduce the 15 minute segment and later of the ZR2-1/1P alignment tape.

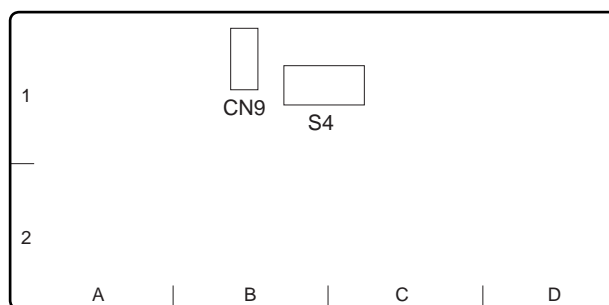
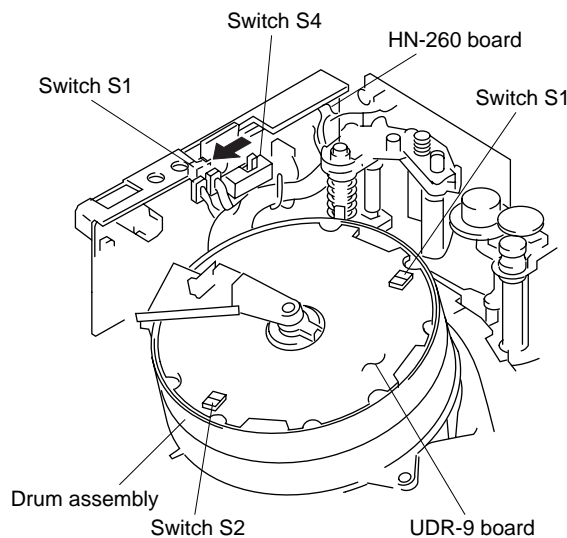
4. Measuring equipment : Oscilloscope  
Measurement point : TP tool board for tape path adjustment  
CH-1 : RECRF A  
CH-2 : PGADJREF  
Adjustment control : **RV1** (HN-260 board)  
Specifications :  $A=4.2 \pm 0.5 \mu\text{sec}$



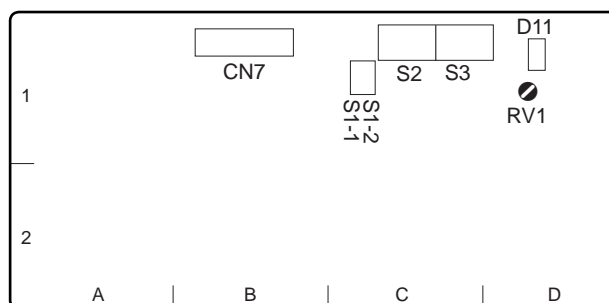
5. Press S2 (HN-260 board).
6. Press S3 (HN-260 board). (The adjustment data is saved.)

### Setting upon Completion of Adjustment

- S1-1, S1-2 (UDR-9 board) → REC (OFF)
- S2-1, S2-2 (UDR-9 board) → REC (OFF)
- S4 (HN-260 board) → REC
- S1-1 (HN-260 board) → OFF
- S1-2 (HN-260 board) → OFF
- Remove the TP tool and re-connect the connectors to the original connections.



HN-260 board (A side)



HN-260 board (B side)

## 6-4. Audio System Adjustment

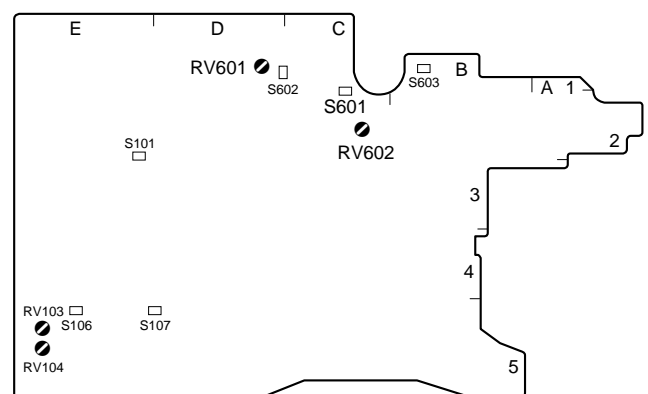
### 6-4-1. D/A Level Adjustment

#### Preparation

- S601 (TC-101 board) → OFF (CUE ON/OFF)  
(Default setting: OFF)
- Insert the alignment tape (ZR5-1/1P) and play back a 1 kHz, −20 dB FS segment (TIME: 00:00:00:00-00:02:00:00).

#### Adjustment Procedure

1. Measuring equipment : Audio analyzer  
Measurement point : AUDIO OUT connector  
(rear panel)  
CH1 (X) : pin-2  
CH1 (Y) : pin-3  
GND : pin-1  
Adjustment control : ●RV601 (TC-101 board)  
Spec. :  $0.0 \pm 0.1$  dBm (at 600  $\Omega$  loads)
2. Measuring equipment : Audio analyzer  
Measurement point : AUDIO OUT connector  
(rear panel)  
CH2 (X) : pin-4  
CH2 (Y) : pin-5  
GND : pin-1  
Adjustment control : ●RV602 (TC-101 board)  
Spec. :  $0.0 \pm 0.1$  dBm (at 600  $\Omega$  loads)



TC-101 board (B side)

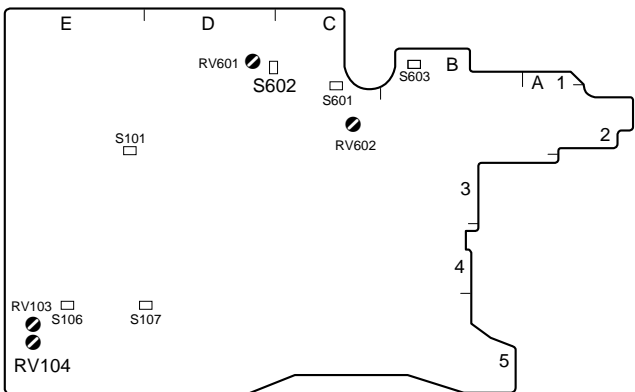
6-4-2. Output Limiter Adjustment

Preparation

- S602 (TC-101 board)  
→ ON (CH-1 OUTPUT LIMITER ON)  
(default setting: ON)
- Insert the alignment tape (ZR5-1/1P) and play back a 1 kHz, 0 dB FS segment (TIME: 00:02:00:00 - 00:04:00:00).

Adjustment Procedure

1. Measuring equipment : Audio analyzer  
Measurement point : AUDIO OUT connector  
(rear panel)  
CH1 (X) : pin-2  
CH1 (Y) : pin-3  
GND : pin-1  
Adjustment control : ⚙RV104 (TC-101 board)  
Spec. :  $9.0 \pm 0.2$  dBm (at 600  $\Omega$  loads)



TC-101 board (B side)

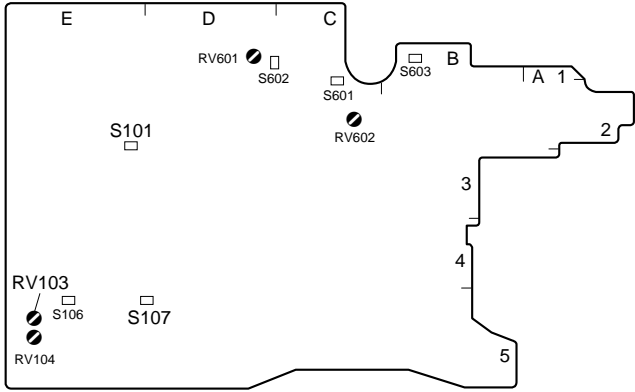
6-4-3. AGC Level Adjustment

Preparation

- AUDIO SELECT CH1 switch (inside panel) → AUTO
- AUDIO IN CH1 switch (inside panel) → REAR
- AUDIO IN CH1 LINE/MIC switch (rear panel) → LINE
- S107 (TC-101 board) → OFF (CH-1 limiter OFF)  
(default setting: OFF)
- S101 (TC-101 board) → OFF (CH-1 Front MIC control ON/OFF)  
(Default setting: OFF)
- Input a 1 kHz, +4.0 dBu sine wave to the AUDIO IN CH-1 connector.

Adjustment Procedure

1. Measuring equipment : Audio analyzer  
Measurement point : AUDIO OUT connector  
(rear panel)  
CH1 (X) : pin-2  
CH1 (Y) : pin-3  
GND : pin-1  
Adjustment control : ⚙RV103 (TC-101 board)  
Spec. :  $0.0 \pm 0.2$  dBm (at 600  $\Omega$  loads)






TC-101 board (B side)

## 6-4-4. CUE Playback Level Adjustment

### Preparation

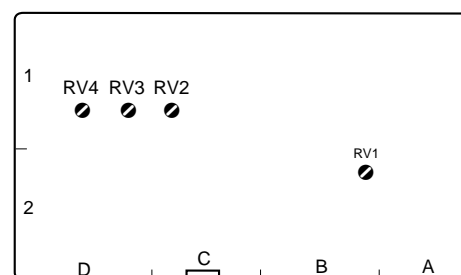
S601 (TC-101 board)  
→ ON (CUE ON) (Default setting: OFF)

### Adjustment Procedure

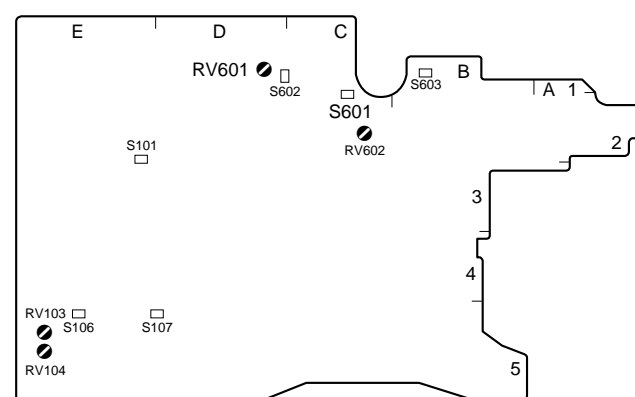
- Insert the alignment tape (ZR5-1/1P) and playback the 1 kHz, 0 VU signal. (TIME: 00:00:00:00 - 00:01:24:29)  
Measuring equipment : Audio analyzer  
Measurement point : AUDIO OUT connector (rear panel)  
Adjustment control :  RV4 (CUE-2 board)  
Spec. :  $0 \pm 0.4$  dBm (at 600  $\Omega$  loads)
- Press the STOP button.
- Playback the signal of 1 kHz and -20 VU (TIME: 00:01:30:00 - 00:02:24:29).  
Measuring equipment : Audio analyzer  
Measurement point : AUDIO OUT connector (rear panel)  
Measures the playback level.
- Playback the 7 kHz, -20 VU signal. (TIME: 00:03:00:00 - 00:03:24:29)  
Measuring equipment : Audio analyzer  
Measurement point : AUDIO OUT connector (rear panel)  
Adjustment control :  RV3 (CUE-2 board)  
Spec. : Within the range of  $\pm 1.5$  dB with reference to the playback level of the 1 kHz signal.
- Playback the signal of 12 kHz and -20 VU (TIME: 00:04:00:00 - 00:04:24:29).  
Measuring equipment : Audio analyzer  
Measurement point : AUDIO OUT connector (rear panel)  
Adjustment control :  RV2 (CUE-2 board)  
Spec. : Within the range of  $\pm 1.5$  dB with reference to the playback level of the 1 kHz signal.
- Press the STOP button.

### Setting upon Completion of Adjustment

S601 (TC-101 board) → OFF



CUE-2 board (B side)




TC-101 board (B side)

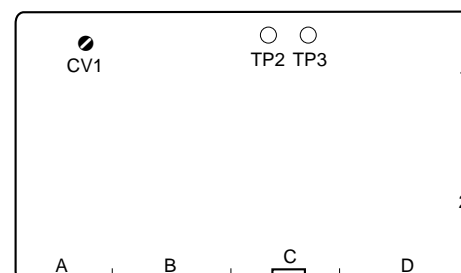
## 6-4-5. CUE Recording Bias Adjustment

### Adjustment Procedure

- Insert a work tape\*1 (BCT-D40) and enter the recording mode.

\*1 : A work tape that is not used so many times is desired.  
The already recorded tape can be used. However, note that the previous signals will be erased during adjustment.

- Measuring equipment : Audio analyzer  
Measurement point : TP2 (CUE-2 board)  
GND : TP3 (CUE-2 board)  
Adjustment control :  CV1 (CUE-2 board)  
Spec. :  $15.0 \pm 1.0$  mVrms



CUE-2 board (A side)

### 6-4-6. CUE Recording Level Adjustment

#### Preparation

[Inside panel]

AUDIO SELECT CH-1 switch → MANUAL  
AUDIO IN CH-1 switch → REAR  
CUE IN switch → CH1  
MONITOR switch → CH1

[TC-101 board]

S101 → OFF (default setting: OFF)  
S107 → OFF (default setting: OFF)  
S601 → OFF (default setting: OFF)

[Rear panel]

AUDIO IN CH-1 LINE/MIC switch → LINE

Check that the audio level of the standard player has already been correctly calibrated.

#### Adjustment Procedure

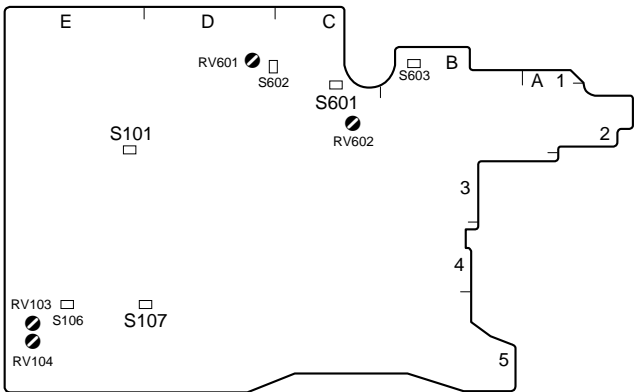
Measurement point: AUDIO OUT of the standard player

1. Connect the output of the generator (SG-5010) to the AUDIO IN CH-1 (1 kHz at +4.0 dBm).
2. Measuring equipment : Audio analyzer  
Measurement point : AUDIO OUT connector (rear panel)  
Adjustment control : LEVEL CH1 (inside panel)  
Spec. :  $0 \pm 0.1$  dBm (at 600  $\Omega$  loads)
3. Insert a work tape\*1 (BCT-D40), and record the signal for 10 seconds.
4. Play back the recorded segment with the standard player, and check that the specification is satisfied.  
Adjustment control :  $\bullet$ RV1 (CUE-2 board)  
Spec. :  $+4.0 \pm 0.2$  dBm (at 600  $\Omega$  loads)

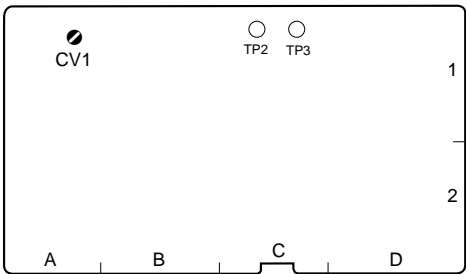
5. Set the output of the generator (SG-5010) to 10 kHz at +4.0 dBu.

6. Measurement point : AUDIO OUT connector (rear panel)  
Adjustment control : LEVEL CH1 (inside panel)  
Spec. :  $0 \pm 0.1$  dBm (at 600  $\Omega$  loads)

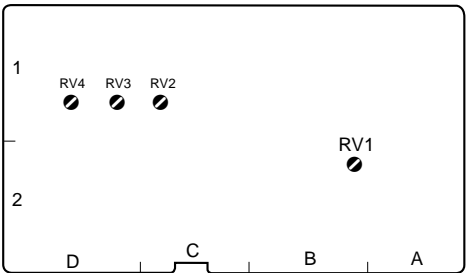
7. Insert a work tape (BCT-D40), and record the signal for 10 seconds.
8. Play back the recorded segment with the standard player, and check that the specification is satisfied.  
Spec. :  $+4.0 \pm 2.5$  dBm (at 600  $\Omega$  loads)
9. If the specification is not satisfied, repeat from steps 5 to 8.  
Adjustment control :  $\bullet$ CV1 (CUE-2 board)



TC-101 board (B side)



CUE-2 board (A side)



CUE-2 board (B side)



## 6-5. Video System Adjustment

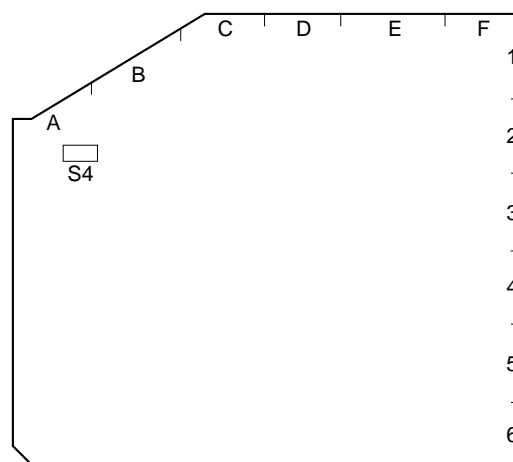
### 6-5-1. Preparation

1. S4-1 (DCP-17 board) → ON (default setting: OFF)
2. S20-4 (DVP-17 board) → ON (default setting: OFF)
3. Turn on the main power.
4. MENU ON/OFF/PAGE switch (inside panel) → ON
5. Operate the rotary encoder (front panel) to open the page of <S56\*VTR ADJ.> on the VF.

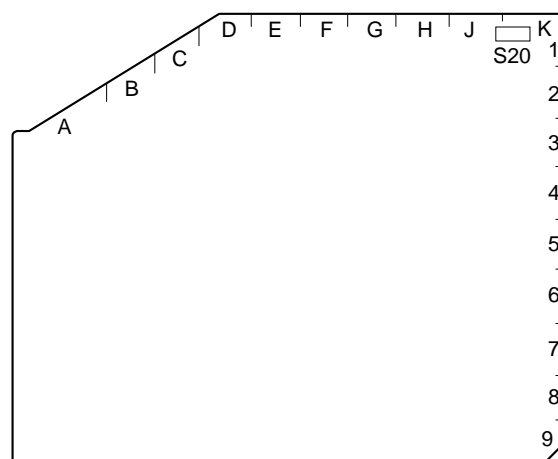
```
? S56*VTR ADJ.
EQ ADJUSTMENT      : OFF
REC CURRENT ADJ.   : OFF
CHECK ERROR RATE   : OFF
```

6. Set the menu item CHECK ERROR RATE to ON by operating the rotary encoder (on the front panel).

```
S56*VTR ADJ.
EQ ADJUSTMENT      : OFF
REC CURRENT ADJ.   : OFF
→ CHECK ERROR RATE : ?ON
  A:- B:- C:- D:-
  E:- F:- G:- H:-
```



DCP-17 board (A side)



DVP-17 board (A side)

## 6-5-2. Playback Equalizer Automatic Adjustment

### Preparation

- “6-5-1 Preparation” must have already been completed.

### Adjustment Procedure

1. Insert the alignment tape (ZR5-1/1P), and locate the TC 00:00:00:00 position of the tape by playing back or other operational modes and stop the tape near the TC 00:00:00:00 position while observing the display window.
2. Start up the EQ ADJUSTMENT menu item by operating the rotary encoder (on the front panel). (Adjustment time: about 7 minutes)
  - VCA adjustment
  - SPEED adjustment
  - COS adjustment
  - PHASE adjustment
  - V REF adjustment

```

S56*VTR ADJ.
→ EQ ADJUSTMENT      : EXEC
REC CURRENT ADJ.      : OFF
CHECK ERROR RATE      : ON
  A:- B:- C:- D:-
  E:- F:- G:- H:-
  
```

3. When the adjustment has ended successfully, the tape is ejected automatically and the message “ADJUST OK!” appears.  
If the adjustment failed, the tape is ejected automatically and the message “ADJUST NG!” appears. If the adjustment has failed, repeat the adjustment starting from step (1).

### Confirmation Procedure

1. Play back the alignment tape (ZR5-1/1P).
2. Check that the CONDITION display of the ERROR RATE item shows the following status.

```

S56*VTR ADJ.
→ EQ ADJUSTMENT      : OFF
REC CURRENT ADJ.      : OFF
CHECK ERROR RATE      : ON
  A:○ B:○ C:○ D:○
  E:○ F:○ G:○ H:○
  
```

(The round black mark (●) or the cross mark (×) i.e., other than the white round mark (○), must not be displayed for 3 seconds or longer.)

If the adjustment still fails, repeat the playback equalizer automatic adjustment starting from step (1) of the adjustment.

### Setting upon Completion of Adjustment

When “6-5-3 Recording Current Automatic Adjustment” has not been performed, return the settings of the following switches to their default positions.

- S4-1 (DCP-17 board) → OFF
- S20-4 (DVP-17 board) → OFF

### 6-5-3. Recording Current Automatic Adjustment

#### Precaution

This adjustment is valid only when the playback equalizer adjustment has been successfully completed.

#### Preparation

- “6-5-1 Preparation” must have already been completed.
- OUTPUT/DCC switch (inside panel) → BARS

#### Adjustment Procedure

1. Insert a work tape\*1 (BCT-D40).

\*1 : A work tape that is not used so many times is desired.  
The already recorded tape can be used. However, note that the previous signals will be erased during adjustment.

2. Start up the REC CURRENT ADJ. menu item by operating the rotary encoder (on the front panel). (Adjustment time: about 3 minutes)
  - A CH adjustment
  - B CH adjustment
  - C CH adjustment
  - D CH adjustment
  - E CH adjustment
  - F CH adjustment
  - G CH adjustment
  - H CH adjustment

#### Note

The RF ALARM flashes during adjustment, but this is normal.

```
S56*VTR ADJ.
EQ ADJUSTMENT      : OFF
→ REC CURRENT ADJ. : EXEC
CHECK ERROR RATE   : ON
A:- B:- C:- D:-
E:- F:- G:- H:-
```

3. When the adjustment has ended successfully, the tape is ejected automatically and the message “ADJUST OK!” appears.

If the adjustment failed, the tape is also ejected automatically and the message “ADJUST NG!” appears. If the adjustment has failed, repeat the adjustment starting from step 1.

#### Confirmation Procedure

1. Record the color bar signal on a work tape (BCT-D40) and play back. (About 30 seconds)
2. Check that the CONDITION display of the ERROR RATE item shows the following status.

```
S56*VTR ADJ.
EQ ADJUSTMENT      : OFF
→ REC CURRENT ADJ. : OFF
CHECK ERROR RATE   : ON
A:○ B:○ C:○ D:○
E:○ F:○ G:○ H:○
```

(The round black mark (●) or the cross mark (×) i.e., other than the white round mark (○), must not be displayed for 3 seconds or longer.)

If the adjustment still fails, repeat the record current automatic adjustment starting from step 1 of the adjustment.

#### Setting upon Completion of Adjustment

- S4-1 (DCP-17 board) → OFF
- S20-4 (DVP-17 board) → OFF



# Section 7

## Camera System Electrical Alignment

### (Only for DVW-790WS/790WSP/709WS/709WSP)

#### 7-1. General Information for Electrical Adjustment

This section describes adjustment items that are required after this unit repair is repaired or its board is replaced.

##### 7-1-1. Note for Adjustment

Before adjustment, set the main POWER switch to on and the VTR switch to SAVE, then warm up the camcorder for about 10 minutes.

Be sure to turn off the power before extending the plug-in board using the extension board.

##### Indication at the Top Right on the Viewfinder Screen

In adjustment on the setup menu, bars sometimes appear at the top right on the viewfinder screen. The bars indicate the current setting state and adjustable range for the selected item.

##### Screen Mode Setting

Sets the screen mode as follows before performing the adjustment of the each page.

1. Setup menu  
PAGE : E14\*WIDE SCREEN  
ITEM : 16:9/4:3 MODE
2. Sets the screen mode as in the each page.

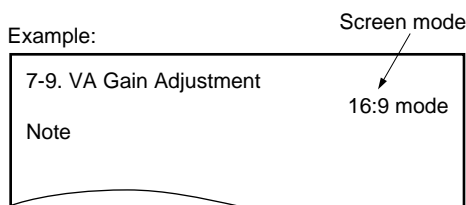
Screen mode

##### Note

Some adjustment steps do not give the description of screen mode. In this case, you can select either 16:9 or 4:3 mode during adjustment.

- 4:3 : Perform adjustment after switched to the 4:3 mode.
- 16:9 : Perform adjustment after switched to the 16:9 mode.
- 16:9 and 4:3 : Perform adjustment after switched first to the 16:9 mode. Upon completion of adjustment in the 16:9 mode, perform adjustment in the 4:3 mode.

Example:



##### 7-1-2. Equipment/Fixtures

- Oscilloscope  
Tektronix 2465 or equivalent
- Waveform/Vector monitor  
Tektronix 1780R/1751 or equivalent
- Color Monitor  
Sony BVM-1410/1411P or equivalent
- Black and white monitor
- Pattern box (PTB-500, 90 - 240 Vac)  
J-6029-140-B
- Multiburst chart : J-6026-110-A
- Grayscale chart (4:3)  
Transparent type : J-6026-130-B  
Reflective type : Commercially available on market  
(Refer to Section 7-1-4.)
- Grayscale chart (16:9)  
Transparent type : J-6394-080-A

##### 7-1-3. Initial Switch Settings

Some adjustments of the Camera System Electrical Alignment require the service mode of the setup menu to be used. Enter the service mode as follows.  
Refer to Section 2 for details of the setup menu.

1. Turn off the POWER switch.
2. Set switch S4-1 on the DCP-17 board to the ON position.
3. Turn the POWER switch back on.
4. Set the switch MENU ON/OFF/PAGE on the inside panel to the ON position.

##### Note

When any item is adjusted in the service mode, the values of the adjusted item in the engineer mode and user mode are re-set to 0.

## Initial Setting

Before performing adjustment, set switches as follows, If the setting of the GAIN switch is changed from the factory set value, reset it to its original value by referring to the operation manual.

### Inside panel :

|                         |            |
|-------------------------|------------|
| VTR SAVE/STBY switch    | → STBY     |
| GAIN switch             | → L (0 dB) |
| OUTPUT/DCC switch       | → CAM/OFF  |
| MENU ON/OFF/PAGE switch | → OFF      |
| WHITE BAL switch        | → PRST     |

### Front panel :

|                 |       |
|-----------------|-------|
| SHUTTER switch  | → OFF |
| Filter selector | → 1B  |

### Lens :

|      |             |
|------|-------------|
| LENS | → MANU      |
| IRIS | → C (CLOSE) |

### Setup menu :

- S06\*MASTER GAIN
 

|      |         |
|------|---------|
| LOW  | → 0 dB  |
| MID  | → 9 dB  |
| HIGH | → 18 dB |
- S12\*FUNCTION 1/2
 

|                  |                   |
|------------------|-------------------|
| TEST OUT         | → ENC             |
| DETAIL           | → ON              |
| APERTURE         | → ON              |
| SKIN TONE DETAIL | → OFF             |
| MATRIX           | → ON              |
| GAMMA            | → ON              |
| BLACK GAMMA      | → OFF             |
| TEST SAW         | → OFF             |
| CHROMA           | → ON              |
| CROSS COLOR FLT. | → OFF (NTSC only) |
- S13\*FUNCTION 2/2
 

|               |       |
|---------------|-------|
| GENLOCK       | → ON  |
| CAM RET       | → OFF |
| FILTER INHBIT | → OFF |
- S21\*LEVEL 4
 

|                 |      |
|-----------------|------|
| KNEE SATURATION | → 0  |
| KNEE            | → ON |
| WHITE CLIP      | → ON |
- S22\*LEVEL 5
 

|     |      |
|-----|------|
| R-Y | → ON |
| B-Y | → ON |

## 7-1-4. Maintaining the Grayscale Chart

For the VA gain adjustment, using an 89.9 %-reflective grayscale chart is preferable.

If a reflective chart is not available, use a well-maintained pattern box and a transparent grayscale chart for adjustment.

Before beginning adjustment, set the illumination of the light source (or the luminous intensity on the chart surface) properly proceeding as follows and set the color temperature to 3200 K exactly by adjusting light.

---

### Information on the Reflective Grayscale Chart

#### Recommended chart

The reflective grayscale chart is commercially available.

Recommended chart: Reflective grayscale chart (with a special case)  
MURAKAMI COLOR RESEARCH LABORATORY GS-3 or equivalent

Supplier: MURAKAMI COLOR RESEARCH LABORATORY  
Address: 3-11-3, Kachidoki, Chuo-ku, Tokyo, JAPAN  
Postcode 104-0054  
Phone: 81-3-3532-3011  
Fax: 81-3-3532-2056

#### Handling precautions

- Do not touch the chart's surface.
- Do not subject the surface to dirt, scratches or prolonged exposure to sunlight.
- Protect the chart from excess moisture and harmful gas.
- Avoid resting articles against the case.
- Open the case and dry the chart more an hour for a month in no use long period.

#### Replacement period when the chart is used as the reference

The reflective grayscale chart should be replaced every two years if it used as the reference. Because the chart deteriorates with time and proper adjustment cannot be achieved.

Replacement period varies according to storage conditions of the chart.

---

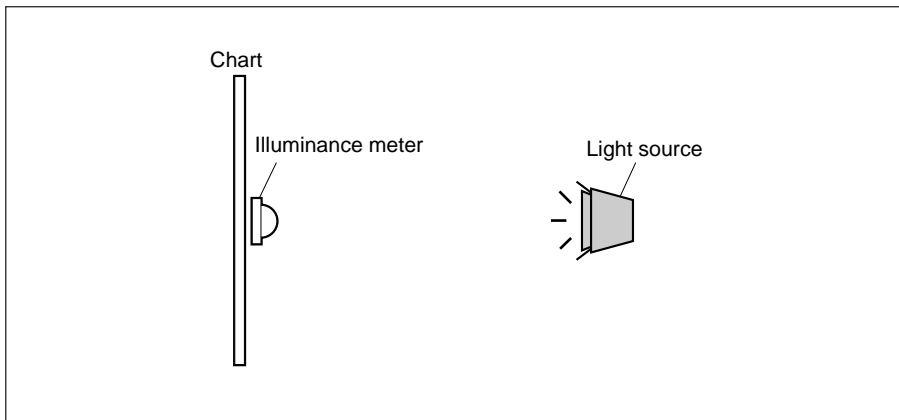
### Setting Illumination (when the reflective chart is used)

Equipment: Illuminance meter (Calibrated)

1. Turn on the light source and warm up for about 30 minutes.
2. Place the illuminance meter on the chart surface.  
Adjust the position and angle of the light source so that the whole surface of the chart is evenly 2000 lx.

**Note**

Light the chart from almost the same direction and height as the camera to shoot the chart.



---

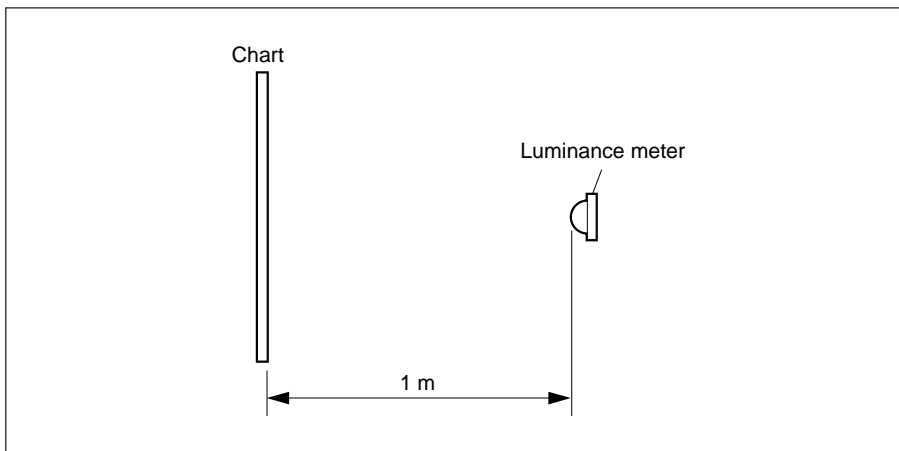
### Setting Luminous Intensity (when the transparent chart is used)

Equipment: Luminance meter (Minolta LS-110 or equivalent. Calibrated.)

1. Light the pattern box and warm up for about 30 minutes.
2. Place the pattern box where the chart is not exposed to light, such as a darkroom.  
(Or cover the pattern box with a cover whose inside is painted in black.)
3. Place the luminance meter facing straight to the chart at a distance of 1 m from it.
4. Adjust the luminance control of the pattern box so that the white portion in the center of the chart is  $573 \pm 6 \text{ cd/m}^2$ .

**Note**

This corresponds to the luminous intensity on the 89.9 %-reflective chart at 2000 lx.





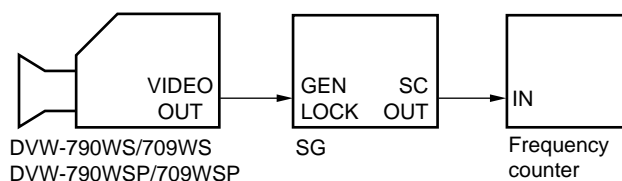
## 7-2. VCO CONT Frequency Check

### Note

- Conduct this check when the TG-207/207P, ES-23/23P boards or CCD block is only replaced.
- Before measurement, turn the power ON and warm up the camcorder for about 10 minutes.

### Preparation

- Connect as follows.



- On the setup menu, set as follows.

PAGE : S12\*FUNCTION 1/2  
ITEM : TEST OUT → ENC

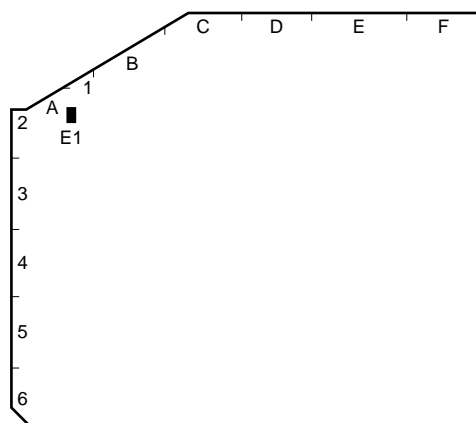
### Adjustment Procedure

- Equipment : Frequency counter, Oscilloscope  
Test point : VIDEO OUT connector  
GND : E1 (DCP-17 board)  
Spec. :  $3,579,545 \pm 10$  Hz (NTSC)  
 $4,433,618 \pm 5$  Hz (PAL)

If the measured value is out of the specification, adjust it as follows.

- On the setup menu, adjust as follows.

PAGE : S40\*ENC ADJ.  
ITEM : INT SC FREQUENCY  
Spec. :  $3,579,545 \pm 10$  Hz (NTSC)  
 $4,433,618 \pm 5$  Hz (PAL)




## 7-3. AD Clock Phase Adjustment

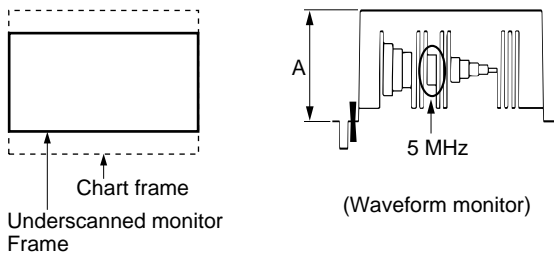
16:9 mode

### Note

Conduct this check when the CCD block or DCP-17 board is only replaced.

### Preparation

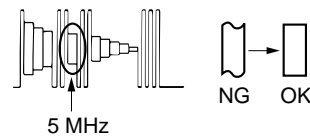
- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- WHITE BAL switch (inside panel) → A
- AUTO W/B BAL switch (front panel) → WHT  
 (Perform the automatic white balance adjustment.)
- Shoot a multiburst chart (4:3) in the underscan's horizontal picture frame.  
 Test point : VIDEO OUT connector  
 setting point :  Lens IRIS  
 Spec. : A (white level) =  $90 \pm 2$  IRE (NTSC)  
           A =  $630 \pm 10$  mV (PAL)



- Pan the camera so that the 5 MHz signal portion of the multiburst chart is positioned at the center of the monitor screen. (Do not change the camera zoom.)

### Adjustment Procedure

- |            |                       |
|------------|-----------------------|
| Equipment  | : Waveform monitor    |
| Test point | : VIDEO OUT connector |
- Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
  - On the setup menu, adjust as follows.  
 PAGE : S54\*AD ADJ.  
 ITEM : AD CLOCK PHASE  
 Spec. : Maximize the 5 MHz signal portion.
  - On the setup menu, adjust as follows.  
 PAGE : S54\*AD ADJ.  
 ITEM : R/B CLOCK PHASE  
 Spec. : Adjust the 5 MHz signal portion to nearly horizontal.



## 7-4. ENC OUT Adjustment

### 7-4-1. ENC Level Adjustment

16:9 and 4:3 modes

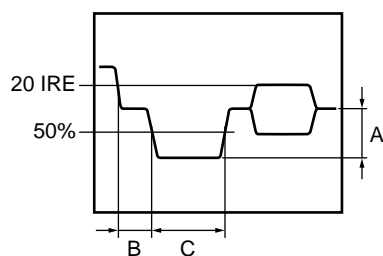
#### Preparation

OUTPUT/DCC switch (inside panel) → BARS

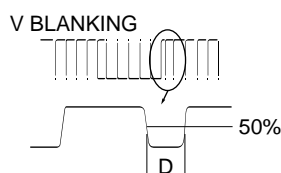
#### Adjustment Procedure

Equipment : Waveform monitor  
 Test point : VIDEO OUT connector

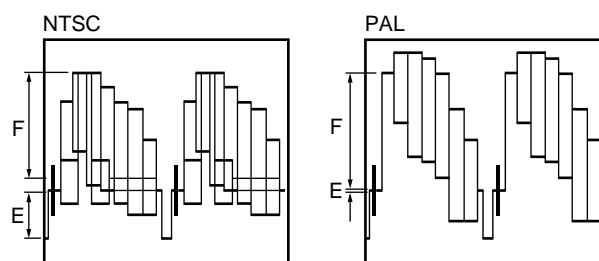
- Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, adjust as follows.  
 PAGE : S23\*LEVEL 6  
 ITEM : ENC Y SYNC  
 Spec. : A =  $40 \pm 1$  IRE (NTSC)  
           A =  $300 \pm 7$  mV (PAL)



- On the setup menu, adjust as follows.  
 PAGE : S40\*ENC ADJ.  
 ITEM : SYNC START  
 Spec. : B =  $1.5 \pm 0.1$   $\mu$ s (NTSC)  
           B =  $1.65 \pm 0.1$   $\mu$ s (PAL)
- On the setup menu, adjust as follows.  
 PAGE : S40\*ENC ADJ.  
 ITEM : SYNC STOP  
 Spec. : C =  $4.7 \pm 0.1$   $\mu$ s
- Check as follows.  
 Spec. : D =  $2.3 \pm 0.1$   $\mu$ s



- On the setup menu, adjust as follows.  
 PAGE : S23\*LEVEL 6  
 ITEM : ENC Y SETUP  
 Spec. : E =  $7.5 \pm 0.5$  IRE (NTSC)  
           E =  $0 \pm 3$  mV (PAL)
- On the setup menu, adjust as follows.  
 PAGE : S23\*LEVEL 6  
 ITEM : ENC Y LEVEL  
 Spec. : F =  $100 \pm 2$  IRE (NTSC)  
           F =  $700 \pm 14$  mV (PAL)



- Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3
- On the setup menu, adjust as follows.  
 PAGE : S23\*LEVEL 6  
 ITEM : ENC Y LEVEL <4:3>  
 Spec. : F =  $100 \pm 2$  IRE (NTSC)  
           F =  $700 \pm 14$  mV (PAL)

## 7-4-2. Chroma Adjustment

16:9 and 4:3 modes

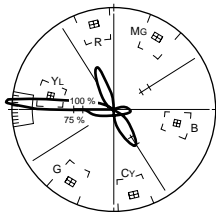
### Preparation

OUTPUT/DCC switch (inside panel) → BARS

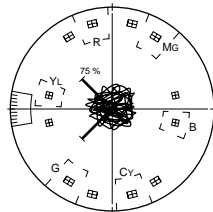
### Adjustment Procedure

Equipment : Waveform/Vector monitor  
 Test point : VIDEO OUT connector

- Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
- Setting of vector monitor.  
 GAIN : MAX
- On the setup menu, adjust as follows.  
 PAGE : S40\*ENC ADJ.  
 ITEM : R-Y CARRIER BAL.  
 B-Y CARRIER BAL.  
 Spec. : Adjust the illuminated spot at the center of the vector monitor.

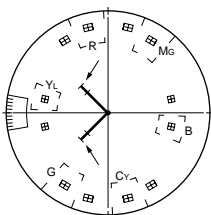


(For NTSC)

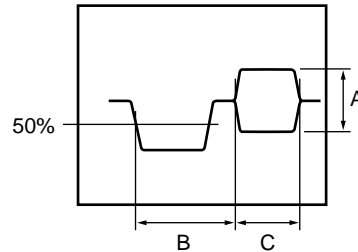


(For PAL)

- Setting of vector monitor.  
 GAIN :  $\times 1$
- On the setup menu, adjust as follows.(For only PAL)  
 PAGE : S22\*LEVEL 5  
 ITEM : BURST PHASE  
 BURST LEVEL  
 Spec. : Position the burst signal on the defined axes and levels.



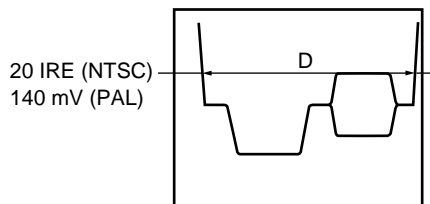
- On the setup menu, adjust as follows.  
 (PAL : Check only)  
 PAGE : S22\*LEVEL 5  
 ITEM : BURST LEVEL  
 Spec. :  $A = 40 \pm 1$  IRE (NTSC)  
 $A = 300 \pm 7$  mV (PAL)



- On the setup menu, adjust as follows.  
 PAGE : S40\*ENC ADJ.  
 ITEM : BURST START  
 Spec. :  $B = 5.3 \pm 0.1 \mu s$  (NTSC)  
 $B = 5.6 \pm 0.1 \mu s$  (PAL)
- On the setup menu, adjust as follows.  
 PAGE : S40\*ENC ADJ.  
 ITEM : BURST STOP  
 Spec. :  $C = 9$  cycles (NTSC)  
 $C = 2.25 \pm 0.2 \mu s$  (PAL)
- Position the burst spot on the defined axis.
- Adjust as follows using the setup menu and  $\odot$ FL12.  
 PAGE : S22\*LEVEL 5  
 ITEM : R-Y LEVEL  
 B-Y LEVEL  
 Adj. point :  $\odot$ FL12 (ES-23/23P board)  
 Spec. : Place the illuminated spots inside the corresponding frames (DP:  $\pm 2.5$  degree, DG:  $\pm 2.5\%$ ) on the vector monitor.
- Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3
- On the setup menu, adjust as follows.  
 PAGE : S22\*LEVEL 5  
 ITEM : R-Y LEVEL <4:3>  
 B-Y LEVEL <4:3>  
 Spec. : Place the illuminated spots inside the corresponding frames (DP :  $\pm 2.5$  degree, DG :  $\pm 2.5\%$ ) on the vector monitor.

13. On the setup menu, adjust as follows.

PAGE : S39\*SG ADJ.  
 ITEM : H BLANKING WIDTH  
 Spec. :  $D = 10.9 \pm 0.2 \mu\text{s}$  (NTSC)  
            $D = 12.0 \pm 0.3 \mu\text{s}$  (PAL)



14. On the setup menu, set as follows. (For only NTSC)

PAGE : S39\*SG ADJ.  
 ITEM : V BLANKING WIDTH  
 Spec. : 20H or 21H

### 7-4-3. INT SC Phase Adjustment

#### Note

The following adjustment procedures are described under the condition by using the Tektronix 1750/1751. If any other measuring instrument is used, perform the adjustment according to the operation manual attached to it.

#### Preparation

- On the setup menu, set as follows.

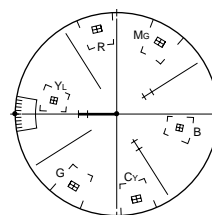
PAGE : S24\*LEVEL 7  
 ITEM : TEST OUT → ENC

#### Adjustment Procedure

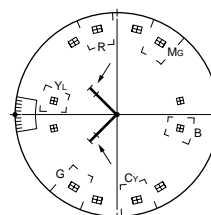
Equipment : Waveform/Vector monitor  
                   (SC-H Phase measuring mode)  
 Test point : TEST OUT connector

- On the setup menu, adjust as follows.

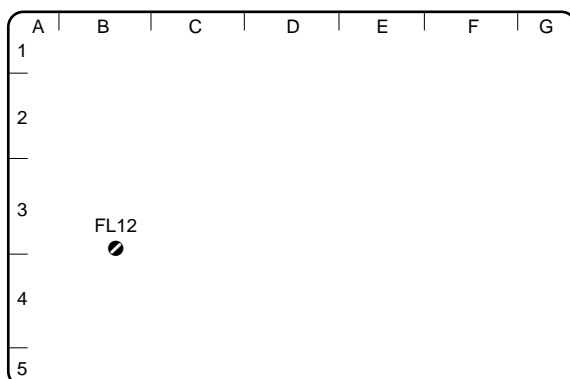
PAGE : S28\*LEVEL 11  
 ITEM : SC PHASE  
 Spec. : Coincide the beam spot of the burst (SC) with the direction of the beam spot of H.



(For NTSC)



(For PAL)



ES-23/23P board (A side)

#### Setting After Adjustment

Connect the waveform monitor to the TEST OUT connector.

## 7-5. TEST OUT Level Adjustment

16:9 and 4:3 mode

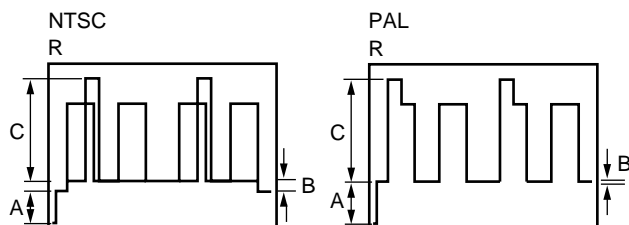
### Preparation

- OUTPUT/DCC switch (inside panel) → BARS
- On the setup menu, set as follows.  
 PAGE : S23\*LEVEL 6  
 ITEM : TEST OUT → R, G or B

### Adjustment Procedure

Equipment : Waveform/Vector monitor  
 Test point : TEST OUT connector

1. Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
2. On the setup menu, adjust as follows.  
 PAGE : S23\*LEVEL 6  
 ITEM : RGB SYNC  
 Spec. :  $A = 40 \pm 2$  IRE (NTSC)  
            $A = 300 \pm 14$  mV (PAL)
3. On the setup menu, adjust as follows.  
 PAGE : S23\*LEVEL 6  
 ITEM : RGB SETUP  
 Spec. :  $B = 7.5 \pm 0.5$  IRE (NTSC)  
            $B = 0 \pm 3$  mV (PAL)
4. On the setup menu, adjust as follows.  
 PAGE : S23\*LEVEL 6  
 ITEM : RGB LEVEL  
 Spec. :  $C = 100 \pm 2$  IRE (NTSC)  
            $C = 700 \pm 14$  mV (PAL)



5. Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3

6. On the setup menu, adjust as follows.

PAGE : S23\*LEVEL 6  
 ITEM : RGB LEVEL <4:3>  
 Spec. :  $C = 100 \pm 2$  IRE (NTSC)  
            $C = 700 \pm 14$  mV (PAL)

### Setting After Adjustment

- On the setup menu, set as follows.  
 PAGE : S23\*LEVEL 6  
 ITEM : TEST OUT → ENC

## 7-6. Modulator Balance Adjustment

---

### Preparation

- WHITE BAL switch (inside panel) → PRST
- OUTPUT/DCC switch (inside panel) → CAM/ON
- MENU ON/OFF/PAGE switch (inside panel)  
→ OFF

---

### Adjustment Procedure

1. AUTO W/B BAL switch (front panel) → BLK  
Hold this switch in BLK state until the message  
“—MOD BAL—” on the viewfinder is displayed .
2. A few seconds later after releasing the switch, check  
that the message “BLACK OK” is displayed on the  
viewfinder.

## 7-7. TEST SAW Adjustment

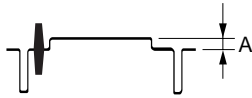
### Preparation

- OUTPUT/DCC switch (inside panel) → CAM/ON
- WHITE BAL switch (inside panel) → PRST

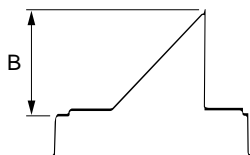
### Adjustment Procedure

Equipment : Waveform monitor  
 Test point : TEST OUT connector

1. On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : GAMMA → OFF
2. AUTO W/B BAL switch (front panel) → BLK  
 (Perform the automatic black balance adjustment.)
3. On the setup menu, adjust as follows.  
 PAGE : S21\*LEVEL 4  
 ITEM : MASTER BLACK  
 Spec. :  $A = 8.0 \pm 0.2$  IRE (NTSC)  
 $A = 2.0 \pm 1.0$  mV (PAL)



4. On the setup menu, set as follows.  
 PAGE : S53\*VA ADJ. 2/2  
 ITEM : TEST SAW → ON
5. On the setup menu, set as follows.  
 PAGE : S53\*VA ADJ. 2/2  
 ITEM : TEST OUT → G
6. On the setup menu, adjust as follows.  
 PAGE : S52\*VA ADJ. 1/2  
 ITEM : TEST LEVEL  
 Spec. :  $B = 100 \pm 2$  IRE (NTSC)  
 $B = 700 \pm 10$  mV (PAL)



### Setting After Adjustment

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : GAMMA → ON  
 ITEM : TEST SAW → OFF  
 ITEM : TEST OUT → ENC



## 7-8. R/B AD Gain Adjustment

### Note

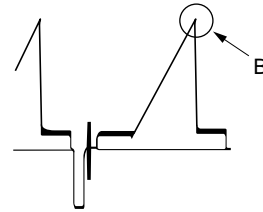
- This adjustment is needed only when the AD board or the VA board is replaced. Do not make any attempt to touch on this adjustment in any other cases.
- Never make any attempt to change the G AD gain data during this adjustment.

### Preparation

- Connect a waveform monitor to the TEST OUT and vector monitor to the VIDEO OUT connectors respectively.
- WHITE BAL switch (inside panel) → PRST
- On the setup menu, set as follows.
 

|      |                    |
|------|--------------------|
| PAGE | : S12*FUNCTION 1/2 |
| ITEM | : TEST SAW → ON    |
| ITEM | : GAMMA → OFF      |
| PAGE | : S21*LEVEL 4      |
| ITEM | : KNEE → OFF       |

4. Make sure that the carrier leakage at portion B is not observed.



### Setting After Adjustment

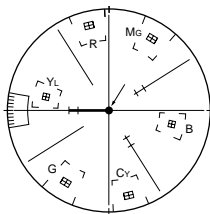
- On the setup menu, set as follows.
 

|      |                    |
|------|--------------------|
| PAGE | : S12*FUNCTION 1/2 |
| ITEM | : TEST SAW → OFF   |
| ITEM | : GAMMA → ON       |
| PAGE | : S21*LEVEL 4      |
| ITEM | : KNEE → ON        |

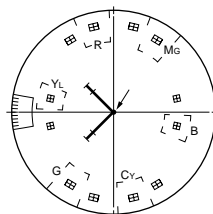
### Adjustment Procedure

1. On the setup menu, adjust as follows.
 

|       |  |
|-------|--|
| PAGE  | : S54*AD ADJ.  |
| ITEM  | : R AD GAIN  |
| Spec. | : Adjust the illuminated spot at the center of the vector monitor. |



(For NTSC)



(For PAL)

2. On the setup menu, adjust as follows.
 

|       |  |
|-------|--|
| PAGE  | : S54*AD ADJ.  |
| ITEM  | : B AD GAIN  |
| Spec. | : Adjust the illuminated spot at the center of the vector monitor. |
3. Repeat steps 1 and 2 several times, adjust the illuminated spot at the center of the vector monitor.

## 7-9. VA Gain Adjustment

16:9 mode

### Note

- Use an 89.9%-reflective chart in this adjustment as possible. (Refer to Section 7-1-4.)
- If a “16:9” chart is not keep on hand, shoot a “4:3” chart so that the chart width is aligned with the underscanned monitor frame.

### Preparation

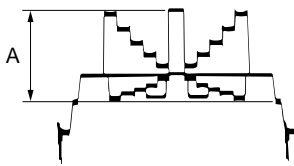
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.
- WHITE BAL switch (inside panel) → PRST
- AUTO W/B BAL switch (front panel) → BLK (Perform the automatic black balance adjustment.)
- On the setup menu, set as follows.
 

|      |                         |
|------|-------------------------|
| PAGE | : S35*PRESET WHT        |
| ITEM | : COLOR TEMP <P> : 3200 |
| ITEM | : R GAIN <P> : 0        |
| ITEM | : B GAIN <P> : 0        |

### Adjustment Procedure

1. Select the 16:9 mode.
 

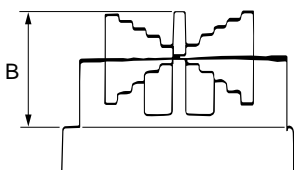
|      |                        |
|------|------------------------|
| PAGE | : S14*WIDE SCREEN      |
| ITEM | : 16:9/4:3 MODE → 16:9 |
2. Equipment : Oscilloscope  
 Test point : TP1 (VA-191 board)  
 Setting point : Lens IRIS

Spec. : A =  $320 \pm 8$  mV

3. On the setup menu, set as follows.
 

|      |                    |
|------|--------------------|
| PAGE | : S12*FUNCTION 1/2 |
| ITEM | : TEST OUT → G     |

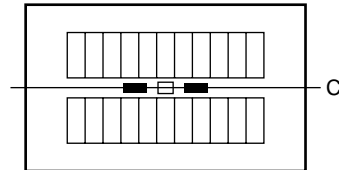
4. Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Adj. point : RV201 (VA-191 board (G GAIN))  
 Spec. : B =  $100 \pm 2$  IRE (NTSC)  
           B =  $700 \pm 10$  mV (PAL)



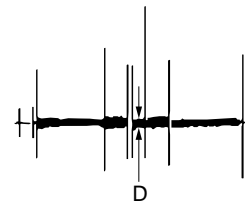
5. On the setup menu, set as follows.
 

|      |                    |
|------|--------------------|
| PAGE | : S12*FUNCTION 1/2 |
| ITEM | : TEST OUT → ENC   |
| ITEM | : GAMMA → OFF      |

6. Select portion C by using the waveform monitor.



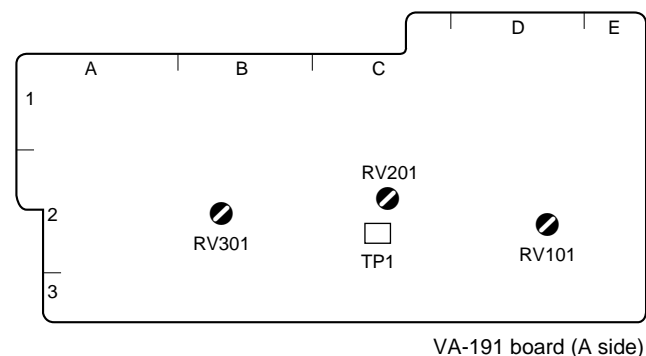
7. Set the waveform monitor to the CHROMA mode.
8. Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Adj. point : RV101 (VA-191 board (R GAIN))  
                RV301 (VA-191 board (B GAIN))  
 Spec. : Minimize carrier leakage D by using the variable resistors alternately.



### Setting After Adjustment

- On the setup menu, set as follows.
 

|      |                    |
|------|--------------------|
| PAGE | : S12*FUNCTION 1/2 |
| ITEM | : GAMMA → ON       |



## 7-10. Preset White Adjustment

### Note

Only when changing the color temperature setting of preset white (PRST), perform this adjustment.

### Preparation

- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a white pattern of color temperature to suit the customer's preferences.

### Adjustment Procedure

1. Equipment : Waveform monitor  
Test point : TEST OUT connector  
setting point : ● Lens IRIS  
Spec. : A =  $90 \pm 2$  IRE (NTSC)  
A =  $630 \pm 10$  mV (PAL)
- On the setup menu, set as follows.  
PAGE : S35\*PRESET WHT  
ITEM : COLOR TEMP. <P>  
ITEM : FINE <WHITE P>  
ITEM : R GAIN <P>  
ITEM : B GAIN <P>  
Spec. : Adjust R GAIN and B GAIN alternately until the carrier leakage is not present on the white pattern signal at any time.

## 7-11. Shading Adjustment

### 7-11-1. Black Shading Adjustment

16:9 mode

### Preparation

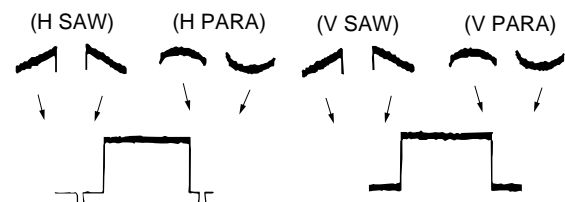
- Lens IRIS → CLOSE
- Waveform monitor setting  
LUM mode  
VOLT FULL SCALE range → 0.5

### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

1. Select the 16:9 mode.  
PAGE : S14\*WIDE SCREEN  
ITEM : 16:9/4:3 MODE → 16:9
2. On the setup menu, set as follows.  
PAGE : S48\*B-SHADING G  
ITEM : TEST OUT → G
3. Make the waveform to flat by rotary encoder according to the table below.
4. Adjust the shading for R and B channels in the same way.

|   | TEST OUT        | H SAW         | V SAW         | H PARA         | V PARA         |
|---|-----------------|---------------|---------------|----------------|----------------|
| G | S48*B-SHADING G |               |               |                |                |
|   | TEST OUT → G    | H SAW<br><BG> | V SAW<br><BG> | H PARA<br><BG> | V PARA<br><BG> |
| R | S49*B-SHADING R |               |               |                |                |
|   | TEST OUT → R    | H SAW<br><BR> | V SAW<br><BR> | H PARA<br><BR> | V PARA<br><BR> |
| B | S50*B-SHADING B |               |               |                |                |
|   | TEST OUT → B    | H SAW<br><BB> | V SAW<br><BB> | H PARA<br><BB> | V PARA<br><BB> |



### Setting After Adjustment

- On the setup menu, set as follows.  
PAGE : S50\*B-SHADING G  
ITEM : TEST OUT → ENC

### 7-11-2. White Shading Adjustment

#### Note

This adjustment could not be correctly performed if the uneven white pattern is used, luminance is not correct, or lens iris and lens zoom are not in good conditions.

16:9 mode

#### Preparation

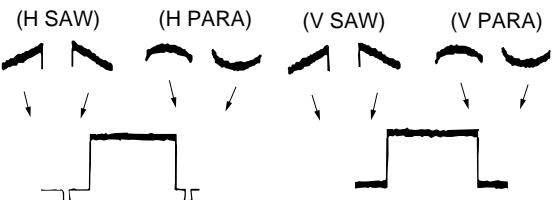
- Lens IRIS → AUTO
- Shoot a fully occupied white area of pattern box in the underscanned monitor frame.
- Waveform monitor setting  
LUM mode  
VOLT FULL SCALE range → 0.5

#### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

1. Select the 16:9 mode.  
PAGE : S14\*WIDE SCREEN  
ITEM : 16:9/4:3 MODE → 16:9
2. On the setup menu, set as follows.  
PAGE : S30\*W-SHADING G  
ITEM : TEST OUT → G
3. Make the waveform flat by setup menu according to the table below.
4. Adjust the shading for R and B channels in the same way.

| TEST OUT          | H SAW                  | V SAW                  | H PARA                  | V PARA                  |
|-------------------|------------------------|------------------------|-------------------------|-------------------------|
| G S30*W-SHADING G |                        |                        |                         |                         |
| TEST OUT → G      | H SAW<br>(EXT)<br><WG> | V SAW<br>(EXT)<br><WG> | H PARA<br>(EXT)<br><WG> | V PARA<br>(EXT)<br><WG> |
| R S31*W-SHADING R |                        |                        |                         |                         |
| TEST OUT → R      | H SAW<br>(EXT)<br><WR> | V SAW<br>(EXT)<br><WR> | H PARA<br>(EXT)<br><WR> | V PARA<br>(EXT)<br><WR> |
| B S32*W-SHADING B |                        |                        |                         |                         |
| TEST OUT → B      | H SAW<br>(EXT)<br><WB> | V SAW<br>(EXT)<br><WB> | H PARA<br>(EXT)<br><WB> | V PARA<br>(EXT)<br><WB> |



5. Select the lens extender and adjust in the same way.

| TEST OUT          | H SAW                  | V SAW                  | H PARA                  | V PARA                  |
|-------------------|------------------------|------------------------|-------------------------|-------------------------|
| G S30*W-SHADING G |                        |                        |                         |                         |
| TEST OUT → G      | H SAW<br>(EXT)<br><WG> | V SAW<br>(EXT)<br><WG> | H PARA<br>(EXT)<br><WG> | V PARA<br>(EXT)<br><WG> |
| R S31*W-SHADING R |                        |                        |                         |                         |
| TEST OUT → R      | H SAW<br>(EXT)<br><WR> | V SAW<br>(EXT)<br><WR> | H PARA<br>(EXT)<br><WR> | V PARA<br>(EXT)<br><WR> |
| B S32*W-SHADING B |                        |                        |                         |                         |
| TEST OUT → B      | H SAW<br>(EXT)<br><WB> | V SAW<br>(EXT)<br><WB> | H PARA<br>(EXT)<br><WB> | V PARA<br>(EXT)<br><WB> |

#### Setting After Adjustment

- On the setup menu, set as follows.  
PAGE : S32\*W-SHADING B  
ITEM : TEST OUT → ENC

## 7-12. Gamma Correction Adjustment

16:9 mode

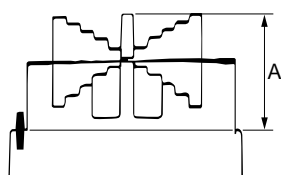
### Preparation

- Lens IRIS → MAN
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.

Equipment : Waveform/Vector monitor

Test point : TEST OUT connector

Setting point : ● Lens IRIS

Spec. : A (white level) =  $100 \pm 2$  IRE (NTSC)A (white level) =  $700 \pm 14$  mV (PAL)

- On the setup menu, set as follows.

PAGE : S24\*LEVEL 7

ITEM : TEST OUT → G

### Adjustment Procedure

Equipment : Waveform/Vector monitor

Test point : TEST OUT connector

1. Select the 16:9 mode.

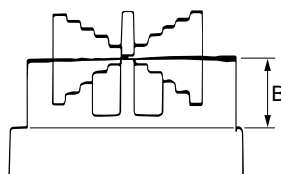
PAGE : S14\*WIDE SCREEN

ITEM : 16:9/4:3 MODE → 16:9

2. On the setup menu, adjust as follows.

PAGE : S21\*LEVEL 4

ITEM : MASTER GAMMA

Spec. : B =  $63 \pm 2$  IRE (NTSC)B =  $420 \pm 14$  mV (PAL)

3. On the setup menu, set as follows.

PAGE : S12\*FUNCTION 1/2

ITEM : TEST OUT → ENC

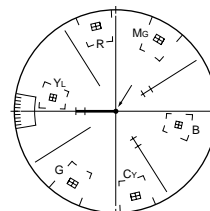
ITEM : TEST SAW → ON

4. On the setup menu, adjust as follows.

PAGE : S25\*LEVEL 8

ITEM : R GAMMA

Spec. : Position the illuminated spot at the center of the vector monitor.



5. On the setup menu, adjust as follows.

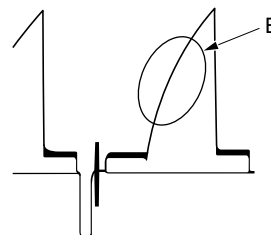
PAGE : S25\*LEVEL 8

ITEM : B GAMMA

Spec. : Position the illuminated spot at the center of the vector monitor.

6. Repeat steps 4 and 5 several times, position the illuminated spot at the center of the vector monitor.

7. Make sure that the carrier leakage at the portion B is not observed.



### Setting After Adjustment

- On the setup menu, set as follows.

PAGE : S12\*FUNCTION 1/2

ITEM : TEST SAW → OFF

## 7-13. Black Set Adjustment

---

### Preparation

- Lens IRIS → CLOSE
- On the setup menu, set as follows.  
PAGE : S24\*LEVEL 7  
ITEM : TEST OUT → G

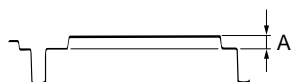
---

### Adjustment Procedure

Equipment : Waveform monitor

Test point : TEST OUT connector

1. On the setup menu, adjust as follows.  
PAGE : S21\*LEVEL 4  
ITEM : MASTER BLACK  
Spec. : A =  $10 \pm 1$  IRE (NTSC)  
A =  $20 \pm 7$  mV (PAL)



---


### Setting After Adjustment

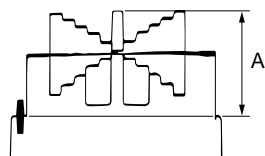
- On the setup menu, set as follows.  
PAGE : S24\*LEVEL 7  
ITEM : TEST OUT → ENC
- AUTO W/B BAL switch (front panel) → BLK  
(Perform the automatic black balance adjustment.)

## 7-14. Flare Adjustment

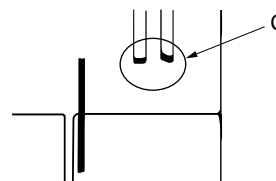
16:9 mode

### Preparation

- On the setup menu, set as follows.  
 PAGE : S24\*LEVEL 7  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point :  Lens IRIS  
 Spec. : Open the lens iris by one step from the reference setting  
 $A = 100 \pm 2 \text{ IRE (NTSC)}$   
 $A = 700 \pm 14 \text{ mV (PAL)}$



- On the setup menu, adjust as follows.  
 PAGE : S24\*LEVEL 7  
 ITEM : R FLARE  
 Spec. : Minimize the carrier leakage at portion C

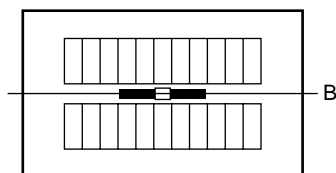


- On the setup menu, adjust as follows.  
 PAGE : S24\*LEVEL 7  
 ITEM : B FLARE  
 Spec. : Minimize the carrier leakage at portion C.
- Repeat steps 4 and 5 several times.

### Adjustment Procedure

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, set as follows.  
 PAGE : S24\*LEVEL 7  
 ITEM : G FLARE → 0
- Select portion B by using the waveform monitor.



## 7-15. Knee and White Clip Adjustments

### 7-15-1. Manual Knee and White Clip Adjustments

#### Preparation

- OUTPUT/DCC switch (inside panel) → CAM/OFF
- WHITE BAL switch (inside panel) → PRST
- GAIN switch (inside panel) → M (9 dB)
- On the setup menu, set as follows.

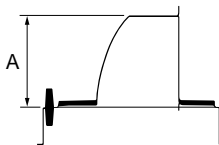
PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST SAW → ON  
 PAGE : S21\*LEVEL 4  
 ITEM : WHITE CLIP → OFF  
 ITEM : KNEE → OFF

#### Adjustment Procedure

Equipment : Waveform monitor  
 Test point : TEST OUT connector

1. On the setup menu, set as follows.  
 PAGE : S21\*LEVEL 4  
 ITEM : KNEE SLOPE → -99

2. On the setup menu, adjust as follows.  
 PAGE : S21\*LEVEL 4  
 ITEM : KNEE POINT  
 Spec. : A =  $98 \pm 2$  IRE (NTSC)  
 A =  $686 \pm 10$  mV (PAL)

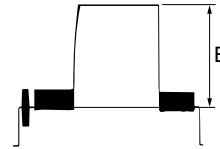


3. GAIN switch (inside panel) → H (18 dB)

4. On the setup menu, set as follows.  
 PAGE : S21\*LEVEL 4  
 ITEM : WHITE CLIP → ON  
 ITEM : KNEE SLOPE → 99

5. On the setup menu, adjust as follows.

PAGE : S21\*LEVEL 4  
 ITEM : WHITE CLIP LEVEL  
 Spec. : B =  $109 \pm 2$  IRE (NTSC)  
 B =  $763 \pm 10$  mV (PAL)



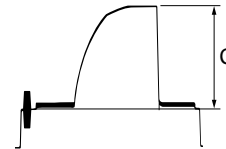
6. GAIN switch (inside panel) → M (9 dB)

7. On the setup menu, set as follows.

PAGE : S21\*LEVEL 4  
 ITEM : WHITE CLIP → OFF

8. On the setup menu, adjust as follows.

PAGE : S21\*LEVEL 4  
 ITEM : KNEE SLOPE  
 Spec. : C =  $109 \pm 2$  IRE (NTSC)  
 C =  $763 \pm 10$  mV (PAL)



#### Setting After Adjustment

- GAIN switch (inside panel) → L (0 dB)
- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST SAW → OFF  
 PAGE : S21\*LEVEL 4  
 ITEM : WHITE CLIP → ON  
 ITEM : KNEE → ON

#### Note

The values used in the above adjustment are for the conditions that the white clip level is set to 109 IRE (763 mV). When the white clip level is set to a value other than 109 IRE (763 mV), use the following table to set the levels of the knee point and knee slope.

|            | WHITE CLIP LEVEL (Unit : IRE/mV) |         |         |         |
|------------|----------------------------------|---------|---------|---------|
|            | 109/763                          | 107/749 | 105/735 | 103/721 |
| KNEE POINT | 98/686                           | 96/686  | 96/672  | 96/672  |
| KNEE SLOPE | 109/763                          | 107/750 | 107/750 | 107/750 |
| WHITE CLIP | 109/763                          | 107/750 | 105/735 | 103/721 |



## 7-15-2. DCC Pre Knee Adjustment

### Preparation

- OUTPUT/DCC switch (inside panel) → CAM/ON
- GAIN switch (inside panel) → M (9 dB)
- WHITE BAL switch (inside panel) → PRST
- On the setup menu, set as follows.

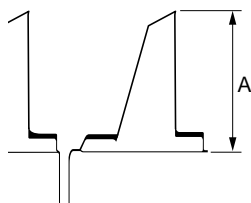
PAGE : S21\*LEVEL 4  
 ITEM : WHITE CLIP → OFF  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST OUT → G  
 ITEM : GAMMA → OFF  
 ITEM : TEST SAW → ON

### Adjustment Procedure

Equipment : Waveform/Vector monitor  
 Test point : TEST OUT connector

1. On the setup menu, adjust as follows.

PAGE : S53\*VA ADJ. 2/2  
 ITEM : G PREKNEE (DCC)  
 Spec. :  $A = 100 \pm 2$  IRE (NTSC)  
            $A = 700 \pm 14$  mV (PAL)

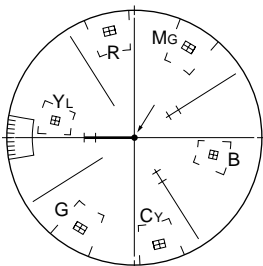


2. On the setup menu, set as follows.

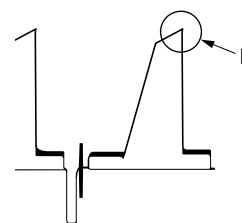
PAGE : S53\*VA ADJ. 2/2  
 ITEM : TEST OUT → ENC

3. On the setup menu, adjust as follows.

PAGE : S53\*VA ADJ. 2/2  
 ITEM : R PREKNEE (DCC)  
 Spec. : Position the illuminated spot at the center of the vector monitor.



4. On the setup menu, adjust as follows.  
 PAGE : S53\*VA ADJ. 2/2  
 ITEM : B PREKNEE (DCC)  
 Spec. : Position the illuminated spot at the center of the vector monitor.
5. Repeat steps 3 and 4 several times, position the illuminated spot at the center of the vector monitor.
6. Make sure that the carrier leakage at portion B is minimum.



### Setting After Adjustment

- On the setup menu, set as follows.


PAGE : S12\*FUNCTION 1/2  
 ITEM : GAMMA → ON  
 ITEM : TEST SAW → OFF  
 PAGE : S21\*LEVEL 4  
 ITEM : WHITE CLIP → ON

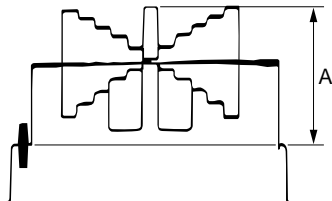
### 7-15-3. DCC Knee Adjustment

#### Note

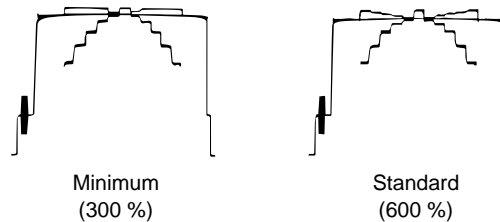
Perform this adjustment, if necessary, to suit the customer's preferences.

#### Preparation

- WHITE BAL switch (inside panel) → PRST
- On the setup menu, set as follows.  
     PAGE : S33\*DCC ADJ.  
     ITEM : DCC POINT → 0  
     ITEM : DCC GAIN → 0
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
- AUTO W/B BAL switch (front panel) → WHT  
 (Perform the automatic white balance adjustment.)
- Equipment : Waveform monitor  
     Test point : TEST OUT connector  
     Setting point :  Lens IRIS  
     Spec. : Open the lens iris by 2.5 steps from the reference setting  
         A = 100 ±2 IRE (NTSC)  
         A = 700 ±14 mV (PAL)



3. Select the lens extender, shoot a grayscale chart in the full underscanned monitor frame.
4. Return the lens extender to its normal position.
5. On the setup menu, adjust as follows.  
     PAGE : S33\*DCC ADJ.  
     ITEM : DCC GAIN (Factory setting : 0)  
     Spec. : Set the desired knee characteristics.



#### Adjustment Procedure

- Equipment : Waveform monitor
- Test point : TEST OUT connector

1. On the setup menu, adjust as follows.  
     PAGE : S33\*DCC ADJ.  
     ITEM : DCC D RANGE  
         (Factory setting : 500 %)  
     Spec. : Set the desired dynamic range.
2. On the setup menu, adjust as follows.  
     PAGE : S33\*DCC ADJ.  
     ITEM : DCC POINT (Factory setting : 0)  
     Spec. : Set the desired knee characteristics.

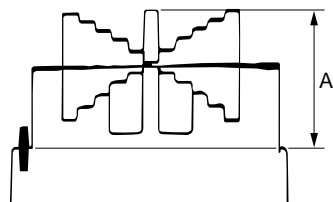
## 7-16. Detail Signal Adjustment (16:9)

### 7-16-1. Crispening Adjustment (16:9)

16:9 mode

#### Preparation

- On the setup menu, set as follows.  
PAGE : S12\*FUNCTION 1/2  
ITEM : DETAIL → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.  
Equipment : Waveform monitor  
Test point : TEST OUT connector  
Setting point : ● Lens IRIS  
Spec. : A =  $100 \pm 2$  IRE (NTSC)  
A =  $700 \pm 14$  mV (PAL)



#### Adjustment Procedure

Equipment : Black and white monitor  
Test point : TEST OUT connector

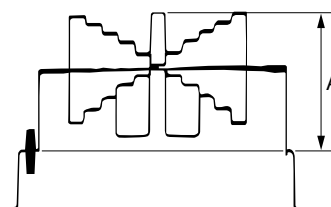
- Select the 16:9 mode.  
PAGE : S14\*WIDE SCREEN  
ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, adjust as follows.  
PAGE : S16\*LEVEL 1  
ITEM : CRISPENING  
Spec. : Reduce the noise at gray portion to a permissible level.

### 7-16-2. Level Dependent Adjustment (16:9)

16:9 mode

#### Preparation

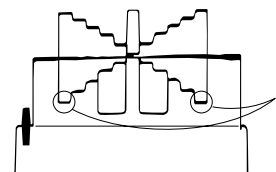
- On the setup menu, set as follows.  
PAGE : S12\*FUNCTION 1/2  
ITEM : DETAIL → ON  
ITEM : TEST OUT → ENC  
PAGE : S16\*LEVEL 1  
ITEM : LVL DEPEND → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.  
Equipment : Waveform monitor  
Test point : TEST OUT connector  
Setting point : ● Lens IRIS  
Spec. : A =  $100 \pm 2$  IRE (NTSC)  
A =  $700 \pm 14$  mV (PAL)



#### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

- Select the 16:9 mode.  
PAGE : S14\*WIDE SCREEN  
ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, adjust as follows.  
PAGE : S16\*LEVEL 1  
ITEM : L.DEP.LVL  
Spec. : Eliminate the detail signal from portion B.



#### Note

After this adjustment, be sure to perform Section 7-16-4 “H/V Ratio Adjustment (16:9)”, and Section 7-16-5 “Detail Level Adjustment (16:9)”, in that order.

**7-16-3. Detail Frequency Adjustment (16:9)**

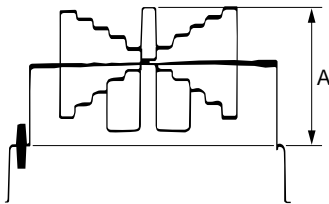
16:9 mode

**Note**

Perform this adjustment, if necessary, to suit the customer's preferences.

**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. : A =  $100 \pm 2$  IRE (NTSC)  
       A =  $700 \pm 14$  mV (PAL)

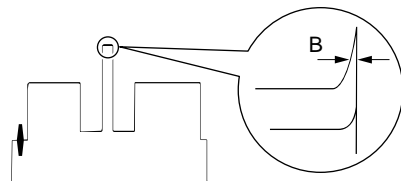


- Select the line at the center white portion of the grayscale chart.

**Adjustment Procedure**

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, adjust as follows.  
 PAGE : S16\*LEVEL 1  
 ITEM : DTL FREQ. (Factory setting: 0)  
 Spec. : Set the desired width at the edge of portion B.

**Note**

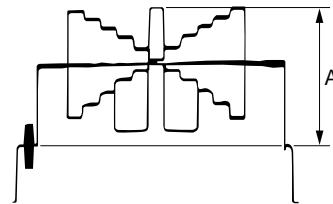
After this adjustment, be sure to perform Section 7-16-4 "H/V Ratio Adjustment (16:9)", and Section 7-16-5 "Detail Level Adjustment (16:9)", in that order.

**7-16-4. H/V Ratio Adjustment (16:9)**

16:9 mode

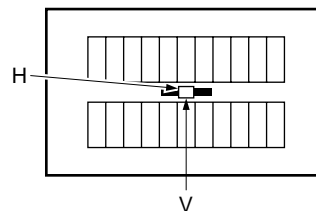
**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. : A =  $100 \pm 2$  IRE (NTSC)  
       A =  $700 \pm 14$  mV (PAL)

**Adjustment Procedure**

Equipment : Black and white monitor  
 Test point : TEST OUT connector

- Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, adjust as follows.  
 PAGE : S16\*LEVEL 1  
 ITEM : H/V RATIO  
 Spec. : Adjust so that the H and V detail amounts which are added are equivalent.




**7-16-5. Detail Level Adjustment (16:9)**

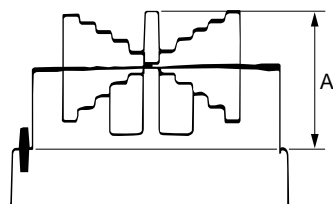
16:9 mode

**Note**

Perform this adjustment, if necessary, to suit the customer's preferences.

**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point :  Lens IRIS  
 Spec. : A =  $80 \pm 2$  IRE (NTSC)  
           A =  $560 \pm 14$  mV (PAL)

**Adjustment Procedure**

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, adjust as follows.  
 PAGE : S16\*LEVEL 1  
 ITEM : DETAIL LVL (Factory setting: 0)  
 Spec. : Adjust to the detail amount which is added to each step in the grayscale chart for the customer's preferences.


**7-16-6. Knee Aperture Adjustment (16:9)**

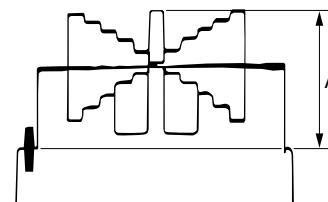
16:9 mode

**Note**

Perform this adjustment, if necessary, to suit the customer's preferences.

**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC  
 PAGE : S17\*LEVEL 2  
 ITEM : KNEE APT. → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point :  Lens IRIS  
 Spec. : A =  $100 \pm 2$  IRE (NTSC)  
           A =  $700 \pm 14$  mV (PAL)

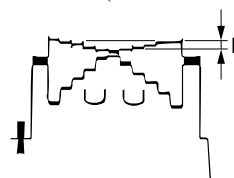


- GAIN switch (inside panel) → M (9 dB)

**Adjustment Procedure**

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, adjust as follows.  
 PAGE : S17\*LEVEL 2  
 ITEM : K.APT.LVL  
 Spec. : Adjust the peak-to-peak level of the noise at the third steps from the top (portion B) in the grayscale chart, as desired. (Reference level is 40 mV)



**7-16-7. H Detail Black Clip Adjustment (16:9)**

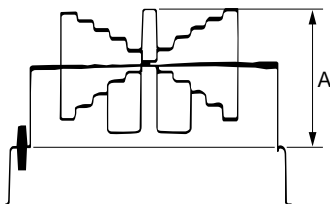
16:9 mode

**Note**

Perform this adjustment, if necessary, to suit the customer's preferences.

**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. : Open the lens iris by one step from the reference setting  
 $A = 100 \pm 2$  IRE (NTSC)  
 $A = 700 \pm 14$  mV (PAL)

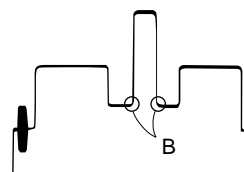


- Select the line at the center white portion of the grayscale chart.

**Adjustment Procedure**

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, adjust as follows.  
 PAGE : S16\*LEVEL 1  
 ITEM : DTL H B. CLIP (Factory setting : 0)  
 Spec. : Set the edges of portion B to the desired clip level.

**7-16-8. V Detail Black Clip Adjustment (16:9)**

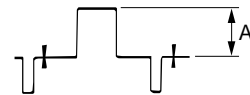
16:9 mode

**Note**

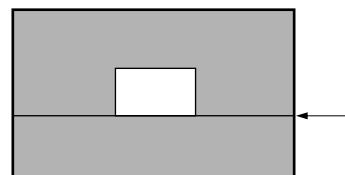
Perform this adjustment, if necessary, to suit the customer's preferences.

**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a white window chart (16:9) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. : Open the lens iris by one step from the reference setting  
 $A = 100 \pm 2$  IRE (NTSC)  
 $A = 700 \pm 14$  mV (PAL)

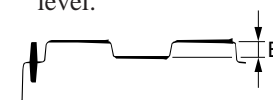


- Select the line at the bottom of the center white portion in the white window chart.

**Adjustment Procedure**

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 16:9 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, adjust as follows.  
 PAGE : S16\*LEVEL 1  
 ITEM : V DTL B. CLIP (Factory setting : 0)  
 Spec. : Set the level of portion B to the desired level.



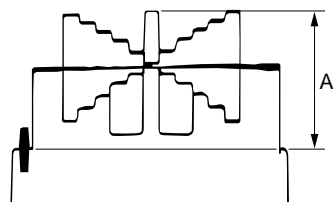
## 7-17. Detail Signal Adjustment (4:3)

### 7-17-1. Crispening Adjustment (4:3)

4:3 mode

#### Preparation

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. : A =  $100 \pm 2$  IRE (NTSC)  
           A =  $700 \pm 14$  mV (PAL)



#### Adjustment Procedure

Equipment : Black and white monitor  
 Test point : TEST OUT connector

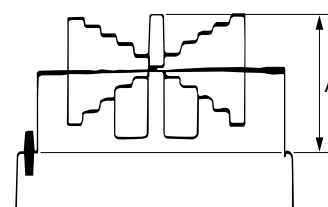
- Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3
- On the setup menu, adjust as follows.  
 PAGE : S18\*LEVEL 1#4:3  
 ITEM : CRISPENING <4:3>  
 Spec. : Reduce the noise at gray portion to a permissible level.

### 7-17-2. Level Dependent Adjustment (4:3)

4:3 mode

#### Preparation

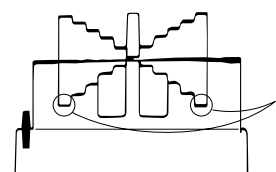
- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC  
 PAGE : S18\*LEVEL 1#4:3  
 ITEM : LVL DEPEND <4:3> → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. : A =  $100 \pm 2$  IRE (NTSC)  
           A =  $700 \pm 14$  mV (PAL)



#### Adjustment Procedure

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3
- On the setup menu, adjust as follows.  
 PAGE : S18\*LEVEL 1#4:3  
 ITEM : L.DEP.LVL <4:3>  
 Spec. : Eliminate the detail signal from portion B.



#### Note

After this adjustment, be sure to perform Section 7-17-4 “H/V Ratio Adjustment (4:3)”, and Section 7-17-5 “Detail Level Adjustment (4:3)”, in that order.

**7-17-3. Detail Frequency Adjustment (4:3)**

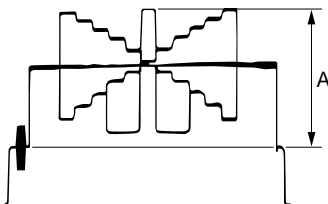
4:3 mode

**Note**

Perform this adjustment, if necessary, to suit the customer's preferences.

**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Setting point : ● Lens IRIS  
 Spec. : A =  $100 \pm 2$  IRE (NTSC)  
       A =  $700 \pm 14$  mV (PAL)

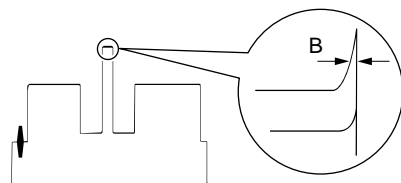


- Select the line at the center white portion of the grayscale chart.

**Adjustment Procedure**

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3
- On the setup menu, adjust as follows.  
 PAGE : S18\*LEVEL 1#4:3  
 ITEM : DTL FREQ. <4:3> (Factory setting: 0)  
 Spec. : Set the desired width at the edge of portion B.

**Note**

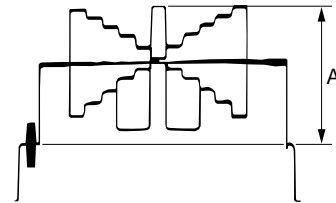
After this adjustment, be sure to perform Section 7-17-4 "H/V Ratio Adjustment (4:3)", and Section 7-17-5 "Detail Level Adjustment (4:3)", in that order.

**7-17-4. H/V Ratio Adjustment (4:3)**

4:3 mode

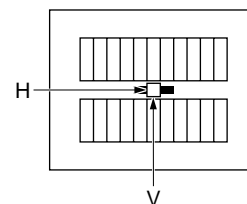
**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. : A =  $100 \pm 2$  IRE (NTSC)  
       A =  $700 \pm 14$  mV (PAL)

**Adjustment Procedure**

Equipment : Black and white monitor  
 Test point : TEST OUT connector

- Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3
- On the setup menu, adjust as follows.  
 PAGE : S18\*LEVEL 1#4:3  
 ITEM : H/V RATIO <4:3>  
 Spec. : Adjust so that the H and V detail amounts which are added are equivalent.





**7-17-5. Detail Level Adjustment (4:3)**

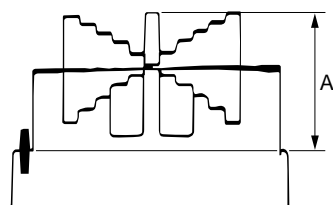
4:3 mode

**Note**

Perform this adjustment, if necessary, to suit the customer's preferences.

**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. : A =  $80 \pm 2$  IRE (NTSC)  
           A =  $560 \pm 14$  mV (PAL)

**Adjustment Procedure**

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3
- On the setup menu, adjust as follows.  
 PAGE : S18\*LEVEL 1#4:3  
 ITEM : DETAIL LVL <4:3>  
           (Factory setting: 0)  
 Spec. : Adjust the detail amount which is added to each step in the grayscale chart for the customer's preferences.

**7-17-6. Knee Aperture Adjustment (4:3)**

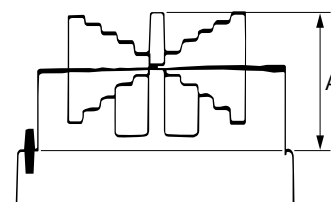
4:3 mode

**Note**

Perform this adjustment, if necessary, to suit the customer's preferences.

**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC  
 PAGE : S19\*LEVEL 2#4:3  
 ITEM : KNEE APT. <4:3> → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. : A =  $100 \pm 2$  IRE (NTSC)  
           A =  $700 \pm 14$  mV (PAL)

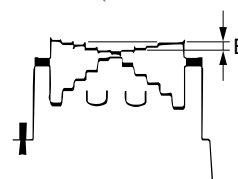


- GAIN switch (inside panel) → M (9 dB)

**Adjustment Procedure**

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3
- On the setup menu, adjust as follows.  
 PAGE : S19\*LEVEL 2#4:3  
 ITEM : K.APT. LVL <4:3>  
 Spec. : Adjust the peak-to-peak level of the noise at the third steps from the top (portion B) in the gray-scale chart, as desired. (Reference level is 40 mV)




**7-17-7. H Detail Black Clip Adjustment (4:3)**

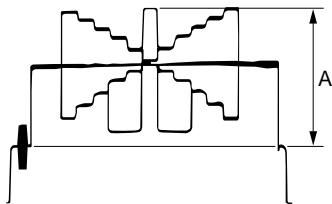
4:3 mode

**Note**

Perform this adjustment, if necessary, to suit the customer's preferences.

**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (4:3) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point :  Lens IRIS  
 Spec. : Open the lens iris by one step from the reference setting  
 $A = 100 \pm 2 \text{ IRE (NTSC)}$   
 $A = 700 \pm 14 \text{ mV (PAL)}$

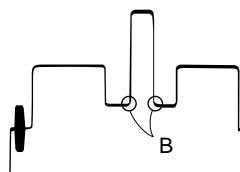


- Select the line at the center white portion of the grayscale chart.

**Adjustment Procedure**

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3
- On the setup menu, adjust as follows.  
 PAGE : S18\*LEVEL 1#4:3  
 ITEM : DTL H B . CLIP <4:3> (Factory setting : 0)  
 Spec. : Set the edges of portion B to the desired clip level.


**7-17-8. V Detail Black Clip Adjustment (4:3)**

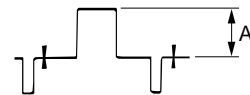
4:3 mode

**Note**

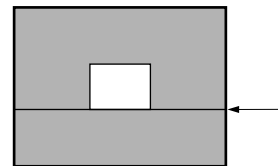
Perform this adjustment, if necessary, to suit the customer's preferences.

**Preparation**

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a white window chart (4:3) in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point :  Lens IRIS  
 Spec. : Open the lens iris by one step from the reference setting  
 $A = 100 \pm 2 \text{ IRE (NTSC)}$   
 $A = 700 \pm 14 \text{ mV (PAL)}$



- Select the line at the bottom of the center white portion in the white window chart.

**Adjustment Procedure**

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- Select the 4:3 mode.  
 PAGE : S14\*WIDE SCREEN  
 ITEM : 16:9/4:3 MODE → 4:3
- On the setup menu, adjust as follows.  
 PAGE : S18\*LEVEL 1#4:3  
 ITEM : DTL V B . CLIP <4:3> (Factory setting : 0)  
 Spec. : Set the level of portion B to the desired level.



## 7-18. Skin Tone Adjustment

### Note

Perform this adjustment, if necessary, to suit the customer's preferences.

### Preparation

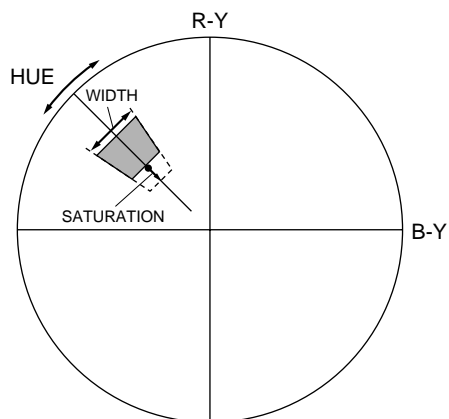
- On the setup menu, set as follows.  
 PAGE : S20\*LEVEL 3  
 ITEM : SKIN TONE DETAIL → ON  
 ITEM : SKIN TONE IND. → ON
- Shoot a person's face.

### Adjustment Procedure

Equipment : Any of color monitor, viewfinder or waveform/vector monitor.

Test point : TEST OUT or VIDEO OUT connector

- Shoot a person's face in the central of the viewfinder.
- On the setup menu, set as follows.  
 PAGE : S20\*LEVEL 3  
 ITEM : SKIN TONE DET. → ?EXEC
- Push the rotary encoder.  
 (The detection area is displayed in a zebra pattern.)
- Perform the adjustment in this step, if necessary.  
 On the setup menu, adjust as follows.  
 PAGE : S20\*LEVEL 3  
 ITEM : SATURATION  
 (Component in the saturation direction)  
 HUE (Hue)  
 WIDTH  
 (Component in the hue direction)



The skin detail detection area is displayed in a zebra pattern.

Adjust so that zebra pattern displays only proper area.

- On the setup menu, adjust as follows.

PAGE : S20\*LEVEL 3  
 ITEM : SUPPRESS LEVEL (Factory setting: 0)  
 Spec. : Set the level to the desired detail level.


### Setting After Adjustment

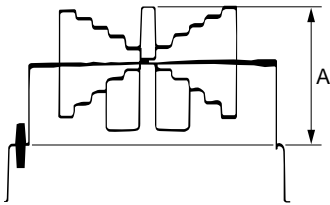
- On the setup menu, set as follows.  
 PAGE : S20\*LEVEL 3  
 ITEM : SKIN TONE DETAIL → OFF  
 ITEM : SKIN TONE IND. → OFF  
 ITEM : SKIN TONE DET. → OFF

## 7-19. Zebra Adjustment

### Preparation

- ZEBRA switch (viewfinder) → ON
- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST OUT → R, G or B  
 PAGE : S15\*VF SETTING  
 ITEM : ZEBRA SELECT → 1  
 ITEM : ZEBRA1 APT. LVL → 1%
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.

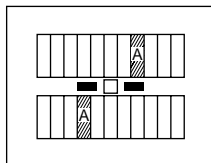
Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point :  Lens IRIS  
 Spec. : A = 100 ±2 IRE (NTSC)  
       A = 700 ±14 mV (PAL)



### Adjustment Procedure

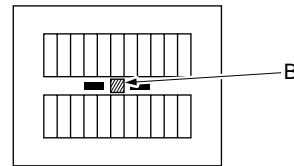
Equipment : Black and white monitor  
 Test point : TEST OUT connector

- On the setup menu, adjust as follows.  
 PAGE : S15\*VF SETTING  
 ITEM : ZEBRA1 DET. LVL  
 Spec. : Set the condition that zebra pattern appears at the portions A.



- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST SAW → ON

- On the setup menu, adjust as follows.  
 PAGE : S15\*VF SETTING  
 ITEM : ZEBRA1 APT. LVL  
 (Factory setting: 10%)  
 Spec. : Adjust for the desired width of detection.
- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST SAW → OFF
- On the setup menu, set as follows.  
 PAGE : S15\*VF SETTING  
 ITEM : ZEBRA SELECT → 2
- On the setup menu, adjust as follows.  
 PAGE : S15\*VF SETTING  
 ITEM : ZEBRA2 DET. LVL  
 Spec. : Set the condition that zebra pattern appears at the portion B.



### Setting After Adjustment

- On the setup menu, set as follows.  
 PAGE : S15\*VF SETTING  
 ITEM : ZEBRA SELECT → 1  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST OUT → ENC

## 7-20. Automatic Iris Adjustment

16:9 mode

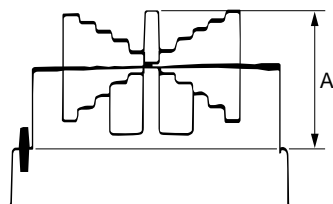
### Preparation

- On the setup menu, set as follows.  
PAGE : S24\*LEVEL 7  
ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart (16:9) in the full underscanned monitor frame.
- Lens IRIS → AUTO

### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

- Select the 16:9 mode.  
PAGE : S14\*WIDE SCREEN  
ITEM : 16:9/4:3 MODE → 16:9
- On the setup menu, adjust as follows.  
PAGE : S29\*LEVEL 12  
ITEM : IRIS MODE  
Spec. : Set depending on the application.  
(Automatic iris operation mode setting can be done from the average level to peak-to-peak level of the video signal.)  
IRIS MODE = MIN → peak-to-peak level  
IRIS MODE = MAX → average level
- On the setup menu, adjust as follows.  
PAGE : S29\*LEVEL 12  
ITEM : IRIS SET  
Spec. :  $A = 100 \pm 2$  IRE (NTSC)  
 $A = 700 \pm 14$  mV (PAL)



- On the setup menu, set as follows.  
PAGE : S29\*LEVEL 12  
ITEM : IRIS WEIGHT → 0 (MIN)
- Shoot an area where the auto iris is not wanted to work in the white window chart.

- On the setup menu, adjust as follows.  
PAGE : S29\*LEVEL 12  
ITEM : IRIS WEIGHT  
Spec. : Increment the IRIS WEIGHT value until the lens iris is open.
- On the setup menu, adjust as follows.  
PAGE : S29\*LEVEL 12  
ITEM : IRIS SPEED (Factory setting: 2)  
Spec. : Set to the desired operation speed of auto iris.
- On the setup menu, set as follows.  
PAGE : S29\*LEVEL 12  
ITEM : CLIP HIGH LIGHT → ON or OFF  
Spec. : Adjust for AUTO iris level to the customer's specifications.

## 7-21. Adjustment After Replacing the Filter Disk Unit

After replacing the filter disk, the white balance adjustment must be corrected. Follow the correction procedure described below.

---

### Preparation

- WHITE BAL switch (on the inside panel) → Position A or B
- Shoot a fully occupied white area of pattern box in the underscanned monitor frame.
- Lens IRIS → AUTO

---

### Adjustment Procedure

Equipment : Color monitor

1. On the setup menu, set as follows.  
PAGE : S55\*ND COMP.  
ITEM : ND DETECTION → EXEC
2. Set the filter knob to the “1B” position.
3. AUTO W/B BAL switch (front panel) → WHT  
(Perform the automatic white balance adjustment.)

**Note**

Check that the indication “ND1 DET. = OK!” appears on the color monitor after the automatic white balance adjustment is completed.

4. Set the filter knob to the “2B” to “4B” positions in turn, and perform step 3 for each position.

**Note**

When the adjustment is completed for all knob positions “1B” to “4B”, the indication “COMPLETE!” appears and the ITEM setup returns automatically to the OFF position.

## Section 8

# Camera System Electrical Alignment

### (Only for DVW-707/707P)

#### 8-1. General Information for Electrical Adjustment

This section describes adjustment items that are required after this unit repair is repaired or its board is replaced.

##### 8-1-1. Note for Adjustment

Before adjustment, set the main POWER switch to on and the VTR switch to SAVE, then warm up the camera for about 10 minutes.

Be sure to turn off the power before extending the plug-in board using the extension board.

##### Indication at the Top Right on the Viewfinder Screen

In adjustment on the setup menu, bars sometimes appear at the top right on the viewfinder screen. The bars indicate the current setting state and adjustable range for the selected item.

##### 8-1-2. Equipment/Fixtures

- Oscilloscope  
Tektronix 2465 or equivalent
- Waveform/Vector monitor  
Tektronix 1780R/1751 or equivalent
- Color Monitor  
Sony BVM-1410/1411P or equivalent
- Black and white monitor
- Pattern box (PTB-500, 90 - 240 Vac) : J-6029-140-B
- Multiburst chart : J-6026-110-A
- Grayscale chart (4:3)  
Transparent type : J-6026-130-B  
Reflective type : Commercially available on market  
(Refer to Section 8-1-4.)

##### 8-1-3. Initial Setting for Switches

Some adjustments of the Camera System Electrical Alignment require the service mode of the setup menu to be used. Enter the service mode as follows.  
Refer to Section 2 for details of the setup menu.

1. Turn off the main POWER switch.
2. Set switch S4-1 on the DCP-17 board to the ON position.
3. Turn the POWER switch back on.
4. Set the switch MENU ON/OFF/PAGE on the inside panel to the ON position.

##### Note

When any item is adjusted in the service mode, the values of the adjusted item in the engineer mode and user mode are re-set to 0.

#### Initial Setting

Before performing adjustment, set switches as follows, If the setting of the GAIN switch is changed from the factory set value, reset it to its original value by referring to the operation manual.

Inside panel :

|                         |            |
|-------------------------|------------|
| VTR SAVE/STBY switch    | → STBY     |
| GAIN switch             | → L (0 dB) |
| OUTPUT/DCC switch       | → CAM/OFF  |
| MENU ON/OFF/PAGE switch | → OFF      |
| WHITE BAL switch        | → PRST     |

Front panel :

|                 |       |
|-----------------|-------|
| SHUTTER switch  | → OFF |
| Filter selector | → 1   |

Lens :

|      |             |
|------|-------------|
| LENS | → MANU      |
| IRIS | → C (CLOSE) |

Setup menu :

- S06\*MASTER GAIN
 

|      |         |
|------|---------|
| LOW  | → 0 dB  |
| MID  | → 9 dB  |
| HIGH | → 18 dB |
- S12\*FUNCTION 1/2
 

|                  |                   |
|------------------|-------------------|
| TEST OUT         | → ENC             |
| DETAIL           | → ON              |
| APERTURE         | → ON              |
| SKIN TONE DETAIL | → OFF             |
| MATRIX           | → ON              |
| GAMMA            | → ON              |
| BLACK GAMMA      | → OFF             |
| TEST SAW         | → OFF             |
| CHROMA           | → ON              |
| CROSS COLOR FLT. | → OFF (NTSC only) |
- S13\*FUNCTION 2/2
 

|                |       |
|----------------|-------|
| GENLOCK        | → ON  |
| CAM RET        | → OFF |
| FILTER INHIBIT | → OFF |
- S21\*LEVEL 4
 

|                 |      |
|-----------------|------|
| KNEE SATURATION | → 0  |
| KNEE            | → ON |
| WHITE CLIP      | → ON |
- S22\*LEVEL 5
 

|     |      |
|-----|------|
| R-Y | → ON |
| B-Y | → ON |

#### 8-1-4. Maintaining the Grayscale Chart

For the VA gain adjustment, using an 89.9 %-reflective grayscale chart is preferable.

If a reflective chart is not available, use a well-maintained pattern box and a transparent grayscale chart for adjustment.

Before beginning adjustment, set the illumination of the light source (or the luminous intensity on the chart surface) properly proceeding as follows and set the color temperature to 3200 K exactly by adjusting light.

---

##### Information on the Reflective Grayscale Chart

###### Recommended chart

The reflective grayscale chart is commercially available.

Recommended chart: Reflective grayscale chart (with a special case)  
MURAKAMI COLOR RESEARCH LABORATORY GS-3 or equivalent

Supplier: MURAKAMI COLOR RESEARCH LABORATORY  
Address: 3-11-3, Kachidoki, Chuo-ku, Tokyo, JAPAN  
Postcode 104-0054  
Phone: 81-3-3532-3011  
Fax: 81-3-3532-2056

###### Handling precautions

- Do not touch the chart's surface.
- Do not subject the surface to dirt, scratches or prolonged exposure to sunlight.
- Protect the chart from excess moisture and harmful gas.
- Avoid resting articles against the case.
- Open the case and dry the chart more an hour for a month in no use long period.

###### Replacement period when the chart is used as the reference

The reflective grayscale chart should be replaced every two years if it used as the reference. Because the chart deteriorates with time and proper adjustment cannot be achieved.

Replacement period varies according to storage conditions of the chart.



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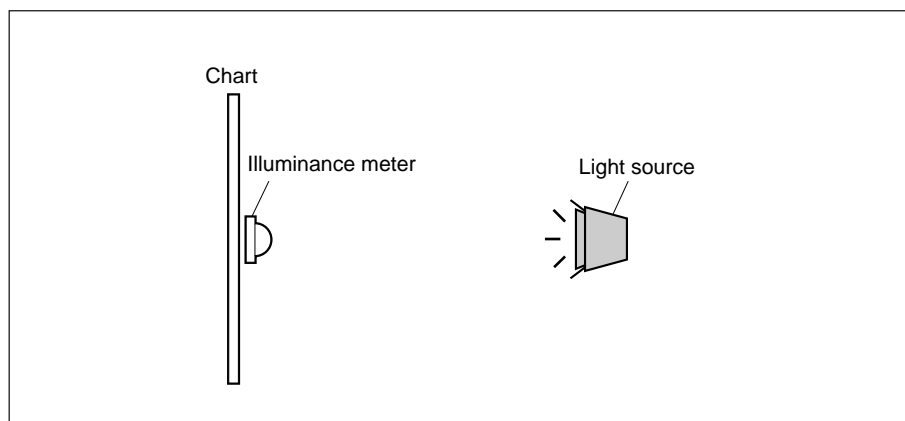
### Setting Illumination (when the reflective chart is used)

Equipment: Illuminance meter (Calibrated)

1. Turn on the light source and warm up for about 30 minutes.
2. Place the illuminance meter on the chart surface.  
Adjust the position and angle of the light source so that the whole surface of the chart is evenly 2000 lx.

**Note**

Light the chart from almost the same direction and height as the camera to shoot the chart.




---

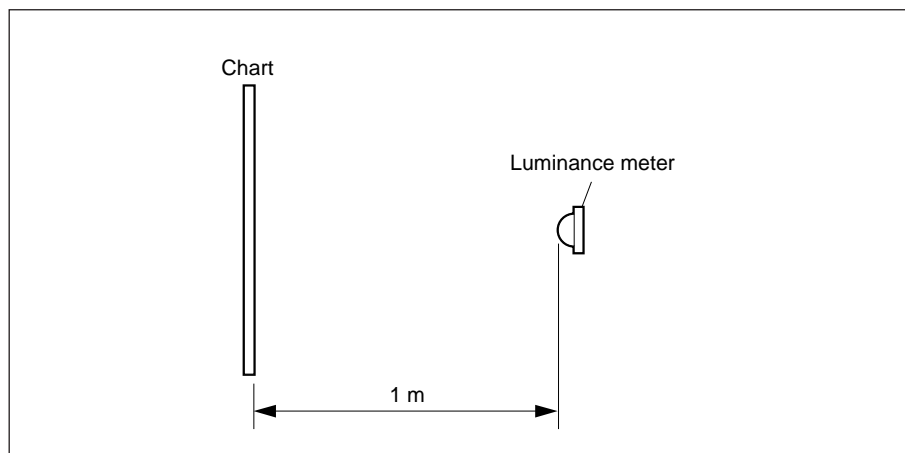
### Setting Luminous Intensity (when the transparent chart is used)

Equipment: Luminance meter (Minolta LS-110 or equivalent. Calibrated.)

1. Light the pattern box and warm up for about 30 minutes.
2. Place the pattern box where the chart is not exposed to light, such as a darkroom.  
(Or cover the pattern box with a cover whose inside is painted in black.)
3. Place the luminance meter facing straight to the chart at a distance of 1 m from it.
4. Adjust the luminance control of the pattern box so that the white portion in the center of the chart is  $573 \pm 6 \text{ cd/m}^2$ .

**Note**

This corresponds to the luminous intensity on the 89.9 %-reflective chart at 2000 lx.



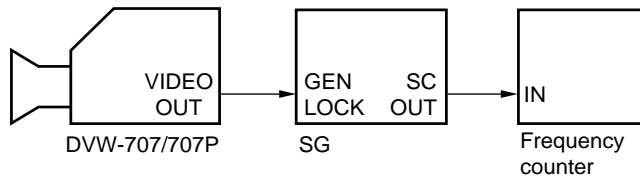
## 8-2. VCO CONT Frequency Check

### Note

- Conduct this check when the TG-206/206P, ES-23/23P boards or CCD block is only replaced.
- Before measurement, turn the power ON and warm up the camcorder for about 10 minutes.

### Preparation

- Connect as follows.



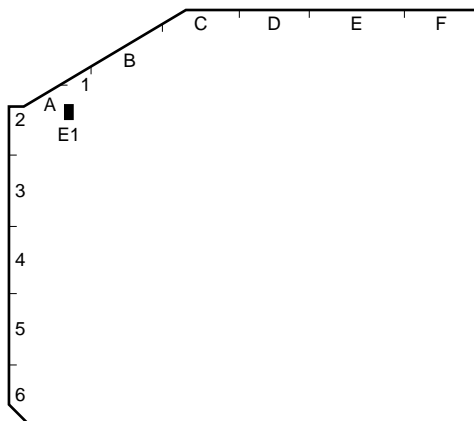
- On the setup menu, set as follows.  
PAGE : S12\*FUNCTION 1/2  
ITEM : TEST OUT → ENC

### Adjustment Procedure

- Equipment : Frequency counter, Oscilloscope  
Test point : VIDEO OUT connector  
GND : E1 (DCP-17 board)  
Spec. :  $3,579,545 \pm 10$  Hz (NTSC)  
 $4,433,618 \pm 5$  Hz (PAL)

If the measured value is out of the specification, adjust it as follows.

- On the setup menu, adjust as follows.  
PAGE : S40\*ENC ADJ.  
ITEM : INT SC FREQUENCY  
Spec. :  $3,579,545 \pm 10$  Hz (NTSC)  
 $4,433,618 \pm 5$  Hz (PAL)



DCP-17 board (A side)

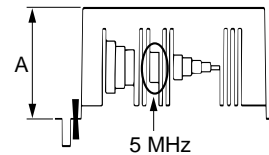
## 8-3. AD Clock Phase Adjustment

### Note

Conduct this check when the CCD block or DCP-17 board is only replaced.

### Preparation

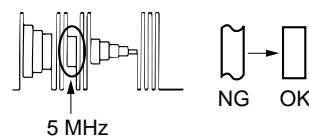
- On the setup menu, set as follows.  
PAGE : S12\*FUNCTION 1/2  
ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- WHITE BAL switch (inside panel) → A
- AUTO W/B BAL switch (front panel) → WHT (Perform the automatic white balance adjustment.)
- Shoot a multiburst chart in the underscanned monitor frame.  
Equipment : Waveform monitor  
Test point : TEST OUT connector  
setting point : ● Lens IRIS  
Spec. : A (white level) =  $90 \pm 2$  IRE (NTSC)  
 $A = 630 \pm 10$  mV (PAL)



- Pan the camera so that the 5 MHz signal portion of the multiburst chart is positioned at the center of the monitor screen. (Do not change the camera zoom.)

### Adjustment Procedure

- On the setup menu, adjust as follows.  
PAGE : S54\*AD ADJ.  
ITEM : AD CLOCK PHASE  
Spec. : Maximize the 5 MHz signal portion.
- On the setup menu, adjust as follows.  
PAGE : S54\*AD ADJ.  
ITEM : R/B CLOCK PHASE  
Spec. : Adjust the 5 MHz signal portion to nearly horizontal.



## 8-4. ENC OUT Adjustment

### 8-4-1. ENC Level Adjustment

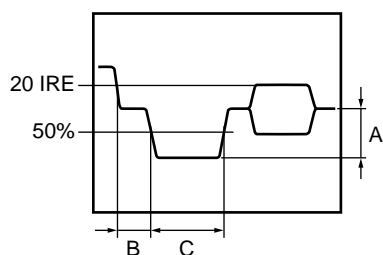
#### Preparation

OUTPUT/DCC switch (inside panel) → BARS

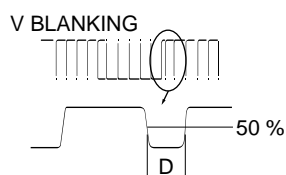
#### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

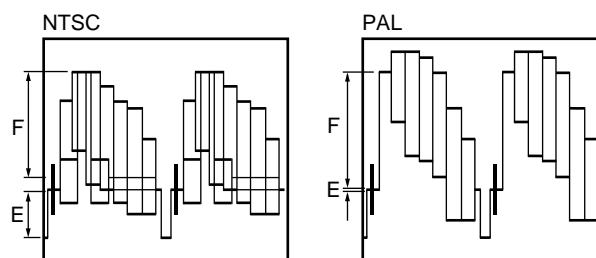
- On the setup menu, adjust as follows.  
PAGE : S23\*LEVEL 6  
ITEM : ENC Y SYNC  
Spec. :  $A = 40 \pm 1$  IRE (NTSC)  
 $A = 300 \pm 7$  mV (PAL)



- On the setup menu, adjust as follows.  
PAGE : S40\*ENC ADJ.  
ITEM : SYNC START  
Spec. :  $B = 1.5 \pm 0.1$   $\mu$ s (NTSC)  
 $B = 1.65 \pm 0.1$   $\mu$ s (PAL)
- On the setup menu, adjust as follows.  
PAGE : S40\*ENC ADJ.  
ITEM : SYNC STOP  
Spec. :  $C = 4.7 \pm 0.1$   $\mu$ s
- Check as follows.  
Spec. :  $D = 2.3 \pm 0.1$   $\mu$ s



- On the setup menu, adjust as follows.  
PAGE : S23\*LEVEL 6  
ITEM : ENC Y SETUP  
Spec. :  $E = 7.5 \pm 0.5$  IRE (NTSC)  
 $E = 0 \pm 3$  mV (PAL)
- On the setup menu, adjust as follows.  
PAGE : S23\*LEVEL 6  
ITEM : ENC Y LEVEL  
Spec. :  $F = 100 \pm 2$  IRE (NTSC)  
 $F = 700 \pm 14$  mV (PAL)



## 8-4-2. Chroma Adjustment

### Preparation

OUTPUT/DCC switch (inside panel) → BARS

### Adjustment Procedure

Equipment : Waveform/Vector monitor  
Test point : VIDEO OUT connector

- Setting of vector monitor.

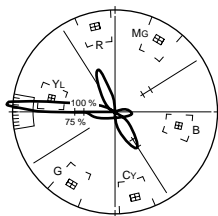
GAIN : MAX

- On the setup menu, adjust as follows.

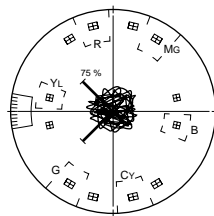
PAGE : S40\*ENC ADJ.

ITEM : R-Y CARRIER BAL.  
B-Y CARRIER BAL.

Spec. : Adjust the illuminated spot at the center of the vector monitor.



(For NTSC)



(For PAL)

- Setting of vector monitor.

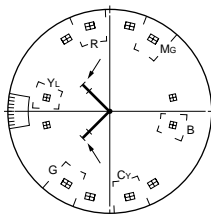
GAIN :  $\times 1$

- On the setup menu, adjust as follows. (For only PAL)

PAGE : S22\*LEVEL 5

ITEM : BURST PHASE  
BURST LEVEL

Spec. : Position the burst signal on the defined axes and levels.

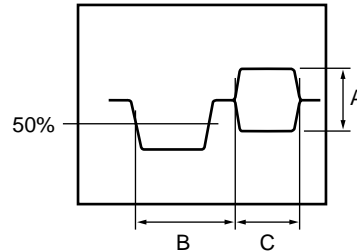


- On the setup menu, adjust as follows.  
(PAL : Check only)

PAGE : S22\*LEVEL 5

ITEM : BURST LEVEL

Spec. :  $A = 40 \pm 1$  IRE (NTSC)  
 $A = 300 \pm 7$  mV (PAL)



- On the setup menu, adjust as follows.

PAGE : S40\*ENC ADJ.

ITEM : BURST START

Spec. :  $B = 5.3 \pm 0.1$   $\mu$ s (NTSC)  
 $B = 5.6 \pm 0.1$   $\mu$ s (PAL)

- On the setup menu, adjust as follows.

PAGE : S40\*ENC ADJ.

ITEM : BURST STOP

Spec. :  $C = 9$  cycles (NTSC)  
 $C = 2.25 \pm 0.2$   $\mu$ s (PAL)

- Position the burst spot on the defined axis.

- Adjust as follows using the setup menu and  $\odot$ FL12.

PAGE : S22\*LEVEL 5

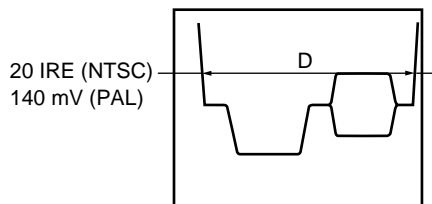
ITEM : R-Y LEVEL  
B-Y LEVEL

Adj. point :  $\odot$ FL12 (ES-23/23P board)

Spec. : Place the illuminated spots inside the corresponding frames (DP:  $\pm 2.5$  degree, DG:  $\pm 2.5\%$ ) on the vector monitor.

10. On the setup menu, adjust as follows.

PAGE : S39\*SG ADJ.  
 ITEM : H BLANKING WIDTH  
 Spec. :  $D = 10.9 \pm 0.2 \mu\text{s}$  (NTSC)  
            $D = 12.0 \pm 0.3 \mu\text{s}$  (PAL)



11. On the setup menu, adjust as follows. (For only NTSC)

PAGE : S39\*SG ADJ.  
 ITEM : V BLANKING WIDTH  
 Spec. : 20H or 21H

### 8-4-3. INT SC Phase Adjustment

#### Note

The following adjustment procedures are described under the condition by using the Tektronix 1750/1751. If any other measuring instrument is used, perform the adjustment according to the operation manual attached to it.

#### Preparation

- On the setup menu, set as follows.

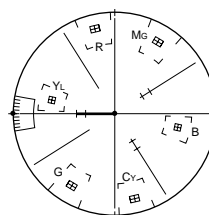
PAGE : S24\*ELEVEL 7  
 ITEM : TEST OUT → ENC

#### Adjustment Procedure

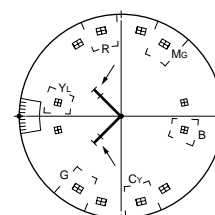
Equipment : Waveform/Vector monitor  
                   (SC-H Phase measuring mode)  
 Test point : TEST OUT connector

- On the setup menu, adjust as follows.

PAGE : S28\*LEVEL 11  
 ITEM : SC PHASE  
 Spec. : Coincide the beam spot of the burst (SC) with the direction of the beam spot of H.



(For NTSC)



(For PAL)

#### Setting After Adjustment

Connect the waveform monitor to the TEST OUT connector.



ES-23 board (A side)

## 8-5. TEST OUT Level Adjustment

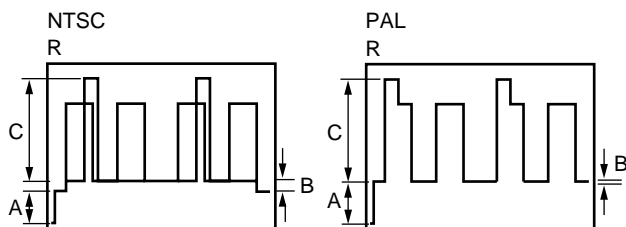
### Preparation

- OUTPUT/DCC switch (inside panel) → BARS
- On the setup menu, set as follows.  
PAGE : S23\*LEVEL 6  
ITEM : TEST OUT → R, G or B

### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.  
PAGE : S23\*LEVEL 6  
ITEM : RGB SYNC  
Spec. : A =  $40 \pm 2$  IRE (NTSC)  
A =  $300 \pm 14$  mV (PAL)
2. On the setup menu, adjust as follows.  
PAGE : S23\*LEVEL 6  
ITEM : RGB SETUP  
Spec. : B =  $7.5 \pm 0.5$  IRE (NTSC)  
B =  $0 \pm 3$  mV (PAL)
3. On the setup menu, adjust as follows.  
PAGE : S23\*LEVEL 6  
ITEM : RGB LEVEL  
Spec. : C =  $100 \pm 2$  IRE (NTSC)  
C =  $700 \pm 14$  mV (PAL)



### Setting After Adjustment

- On the setup menu, set as follows.  
PAGE : S23\*LEVEL 6  
ITEM : TEST OUT → ENC

## 8-6. Modulator Balance Adjustment

### Preparation

- WHITE BAL switch (inside panel) → PRST
- OUTPUT/DCC switch (inside panel) → CAM/ON
- MENU ON/OFF/PAGE switch (inside panel) → OFF

### Adjustment Procedure

1. AUTO W/B BAL switch (front panel) → BLK  
Hold this switch in BLK state until the message “-MOD BAL-” on the viewfinder is displayed .
2. A few seconds later after releasing the switch, check that the message “BLACK OK” is displayed on the viewfinder.

## 8-7. TEST SAW Adjustment

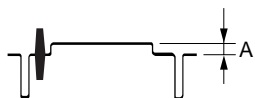
### Preparation

- OUTPUT/DCC switch (inside panel) → CAM/ON
- WHITE BAL switch (inside panel) → PRST

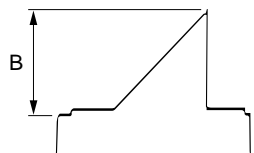
### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

1. On the setup menu, set as follows.  
PAGE : S12\*FUNCTION 1/2  
ITEM : GAMMA → OFF
2. AUTO W/B BAL switch (front panel) → BLK  
(Perform the automatic black balance adjustment.)
3. On the setup menu, adjust as follows.  
PAGE : S21\*LEVEL 4  
ITEM : MASTER BLACK  
Spec. :  $A = 8.0 \pm 0.2$  IRE (NTSC)  
 $A = 2.0 \pm 1.0$  mV (PAL)



4. On the setup menu, set as follows.  
PAGE : S53\*VA ADJ. 2/2  
ITEM : TEST SAW → ON
5. On the setup menu, set as follows.  
PAGE : S53\*VA ADJ. 2/2  
ITEM : TEST OUT → G
6. On the setup menu, adjust as follows.  
PAGE : S52\*VA ADJ. 1/2  
ITEM : TEST LEVEL  
Spec. :  $B = 100 \pm 2$  IRE (NTSC)  
 $B = 700 \pm 10$  mV (PAL)



### Setting After Adjustment

- On the setup menu, set as follows.  
PAGE : S12\*FUNCTION 1/2  
ITEM : GAMMA → ON  
ITEM : TEST SAW → OFF  
ITEM : TEST OUT → ENC

## 8-8. R/B AD Gain Adjustment

### Notes

- This adjustment is needed only when the AD board or the VA board is replaced. Do not make any attempt to touch on this adjustment in any other cases.
- Never make any attempt to change the G AD gain data during this adjustment.

### Preparation

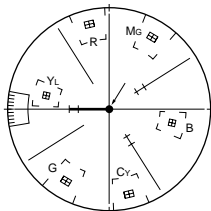
- Connect a waveform monitor to the TEST OUT and vector monitor to the VIDEO OUT connectors respectively.
- WHITE BAL switch (inside panel) → PRST
- On the setup menu, set as follows.
 

|      |                    |
|------|--------------------|
| PAGE | : S12*FUNCTION 1/2 |
| ITEM | : TEST SAW → ON    |
| ITEM | : GAMMA → OFF      |
| PAGE | : S21*LEVEL 4      |
| ITEM | : KNEE → OFF       |

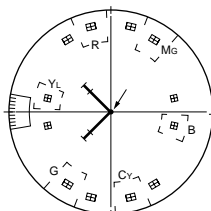
### Adjustment Procedure

- On the setup menu, adjust as follows.
 

|       |  |
|-------|--|
| PAGE  | : S54*AD ADJ.  |
| ITEM  | : R AD GAIN  |
| Spec. | : Adjust the illuminated spot at the center of the vector monitor. |



(For NTSC)

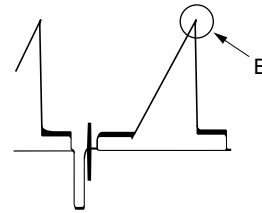


(For PAL)

- On the setup menu, adjust as follows.
 

|       |  |
|-------|--|
| PAGE  | : S54*AD ADJ.  |
| ITEM  | : B AD GAIN  |
| Spec. | : Adjust the illuminated spot at the center of the vector monitor. |
- Repeat steps 1 and 2 several times, adjust the illuminated spot at the center of the vector monitor.

- Make sure that the carrier leakage at portion B is not observed.



### Setting After Adjustment

- On the setup menu, set as follows.
 

|      |                    |
|------|--------------------|
| PAGE | : S12*FUNCTION 1/2 |
| ITEM | : TEST SAW → OFF   |
| ITEM | : GAMMA → ON       |
| PAGE | : S21*LEVEL 4      |
| ITEM | : KNEE → ON        |



## 8-9. VA Gain Adjustment

### Note

Use an 89.9%-reflective chart in this adjustment as possible. (Refer to Section 8-1-4.)

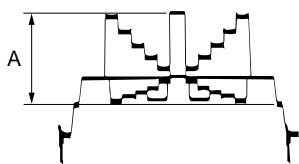
### Preparation

- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
- WHITE BAL switch (inside panel) → PRST
- AUTO W/B BAL switch (front panel) → BLK  
(Perform the automatic black balance adjustment.)
- On the setup menu, set as follows.
 

|      |                         |
|------|-------------------------|
| PAGE | : S35*PRESET WHT        |
| ITEM | : COLOR TEMP <P> : 3200 |
| ITEM | : R GAIN <P> : 0        |
| ITEM | : B GAIN <P> : 0        |

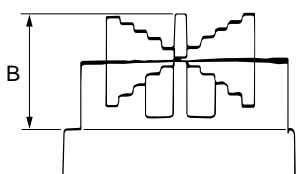
### Adjustment Procedure

- Equipment : Oscilloscope  
 Test point : TP1 (VA-191 board)  
 Setting point : Lens IRIS  
 Spec. :  $A = 320 \pm 8$  mV



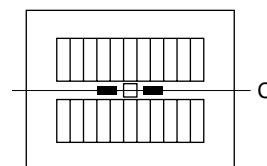
- On the setup menu, set as follows.
 

|      |                    |
|------|--------------------|
| PAGE | : S12*FUNCTION 1/2 |
| ITEM | : TEST OUT → G     |
- Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Adj. point : RV201 (VA-191 board (G GAIN))  
 Spec. :  $B = 100 \pm 2$  IRE (NTSC)  
            $B = 700 \pm 10$  mV (PAL)



- On the setup menu, set as follows.
 

|      |                    |
|------|--------------------|
| PAGE | : S12*FUNCTION 1/2 |
| ITEM | : TEST OUT → ENC   |
| ITEM | : GAMMA → OFF      |
- Select portion C by using the waveform monitor.



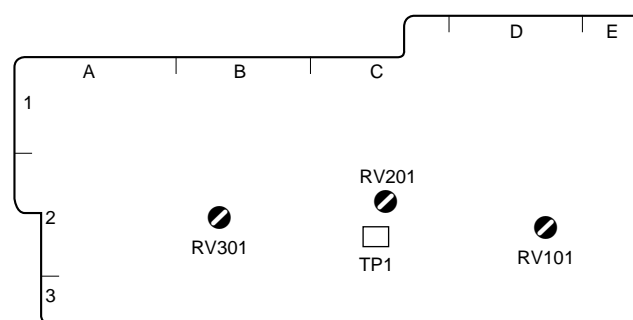
- Set the waveform monitor to the CHROMA mode.
- Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Adj. point : RV101 (VA-191 board (R GIAN))  
                RV301 (VA-191 board (B GAIN))  
 Spec. : Minimize carrier leakage D by using the variable resistors alternately.



### Setting After Adjustment

- On the setup menu, set as follows.
 

|      |                    |
|------|--------------------|
| PAGE | : S12*FUNCTION 1/2 |
| ITEM | : GAMMA → ON       |



VA-191 board (A side)

## 8-10. Preset White Adjustment


### Note

Only when changing the color temperature setting of preset white (PRST), perform this adjustment.

### Preparation

- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a white pattern of color temperature to suit the customer's preferences.

### Adjustment Procedure

1. Equipment : Waveform monitor  
Test point : TEST OUT connector  
setting point :  Lens IRIS  
Spec. : A =  $90 \pm 2$  IRE (NTSC)  
A =  $630 \pm 10$  mV (PAL)
- On the setup menu, adjust as follows.  
PAGE : S35\*PRESET WHT  
ITEM : COLOR TEMP <P>  
ITEM : FINE <WHITEP>  
ITEM : R GAIN <P>  
ITEM : B GAIN <P>  
Spec. : Adjust R GAIN and B GAIN alternately until the carrier leakage is not present on the white pattern signal at any time.

## 8-11. Shading Adjustment

### 8-11-1. Black Shading Adjustment

#### Preparation

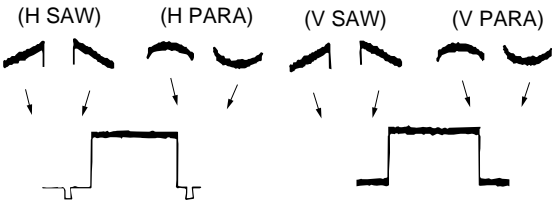
- Lens IRIS → CLOSE
- Waveform monitor setting  
LUM mode  
VOLT FULL SCALE range → 0.5

#### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

1. On the setup menu, set as follows.  
PAGE : S48\*B-SHADING G  
ITEM : TEST OUT → G
2. Make the waveform to flat by rotary encoder according to the table below.
3. Adjust the shading for R and B channels in the same way.

|   | TEST OUT        | H SAW         | V SAW         | H PARA         | V PARA         |
|---|-----------------|---------------|---------------|----------------|----------------|
| G | S48*B-SHADING G |               |               |                |                |
|   | TEST OUT → G    | H SAW<br><BG> | V SAW<br><BG> | H PARA<br><BG> | V PARA<br><BG> |
| R | S49*B-SHADING R |               |               |                |                |
|   | TEST OUT → R    | H SAW<br><BR> | V SAW<br><BR> | H PARA<br><BR> | V PARA<br><BR> |
| B | S50*B-SHADING B |               |               |                |                |
|   | TEST OUT → B    | H SAW<br><BB> | V SAW<br><BB> | H PARA<br><BB> | V PARA<br><BB> |



#### Setting After Adjustment

- On the setup menu, set as follows.  
PAGE : S50\*B-SHADING B  
ITEM : TEST OUT → ENC

## 8-11-2. White Shading Adjustment

### Note

This adjustment could not be correctly performed if the uneven white patten is used, luminance is not correct, or lens iris and lens zoom are not in good conditions.

### Preparation

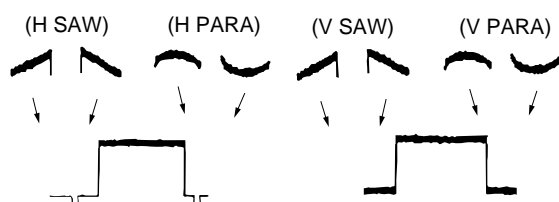
- Lens IRIS → AUTO
- Shoot a fully occupied white area of pattern box in the underscanned monitor frame.
- Waveform monitor setting  
LUM mode  
VOLT FULL SCALE range → 0.5

### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

1. On the setup menu, set as follows.  
PAGE : S30\*W-SHADING G  
ITEM : TEST OUT → G
2. Make the waveform flat by setup menu according to the table below.
3. Adjust the shading for R and B channels in the same way.

| TEST OUT          | H SAW         | V SAW         | H PARA         | V PARA         |
|-------------------|---------------|---------------|----------------|----------------|
| G S30*W-SHADING G |               |               |                |                |
| TEST OUT → G      | H SAW<br><WG> | V SAW<br><WG> | H PARA<br><WG> | V PARA<br><WG> |
| R S31*W-SHADING R |               |               |                |                |
| TEST OUT → R      | H SAW<br><WR> | V SAW<br><WR> | H PARA<br><WR> | V PARA<br><WR> |
| B S32*W-SHADING B |               |               |                |                |
| TEST OUT → B      | H SAW<br><WB> | V SAW<br><WB> | H PARA<br><WB> | V PARA<br><WB> |



4. Select the lens extender and adjust in the same way.

| TEST OUT          | H SAW                  | V SAW                  | H PARA                  | V PARA                  |
|-------------------|------------------------|------------------------|-------------------------|-------------------------|
| G S30*W-SHADING G |                        |                        |                         |                         |
| TEST OUT → G      | H SAW<br>(EXT)<br><WG> | V SAW<br>(EXT)<br><WG> | H PARA<br>(EXT)<br><WG> | V PARA<br>(EXT)<br><WG> |
| R S31*W-SHADING R |                        |                        |                         |                         |
| TEST OUT → R      | H SAW<br>(EXT)<br><WR> | V SAW<br>(EXT)<br><WR> | H PARA<br>(EXT)<br><WR> | V PARA<br>(EXT)<br><WR> |
| B S32*W-SHADING B |                        |                        |                         |                         |
| TEST OUT → B      | H SAW<br>(EXT)<br><WB> | V SAW<br>(EXT)<br><WB> | H PARA<br>(EXT)<br><WB> | V PARA<br>(EXT)<br><WB> |

### Setting After Adjustment

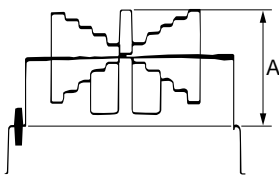
- On the setup menu, set as follows.  
PAGE : S32\*W-SHADING B  
ITEM : TEST OUT → ENC

## 8-12. Gamma Correction Adjustment

### Preparation

- Lens IRIS →MAN
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.

Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ●Lens IRIS  
 Spec. : A (white level) =  $100 \pm 2$  IRE (NTSC)  
           A (white level) =  $700 \pm 14$  mV (PAL)

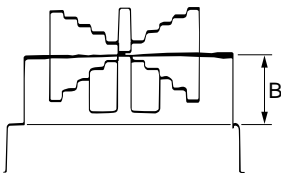


- On the setup menu, set as follows.  
 PAGE : S24\*LEVEL 7  
 ITEM : TEST OUT → G

### Adjustment Procedure

Equipment : Waveform/Vector monitor  
 Test point : TEST OUT connector

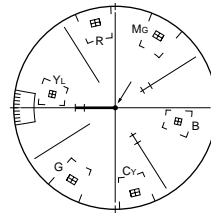
- On the setup menu, adjust as follows.  
 PAGE : S21\*LEVEL 4  
 ITEM : MASTER GAMMA  
 Spec. : B =  $63 \pm 2$  IRE (NTSC)  
           B =  $420 \pm 14$  mV (PAL)



- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST OUT → ENC  
 ITEM : TEST SAW → ON

- On the setup menu, adjust as follows.

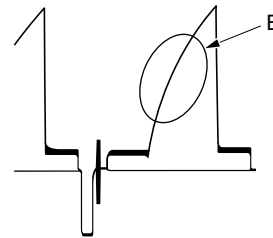
PAGE : S25\*LEVEL 8  
 ITEM : R GAMMA  
 Spec. : Position the illuminated spot at the center of the vector monitor.



- On the setup menu, adjust as follows.

PAGE : S25\*LEVEL 8  
 ITEM : B GAMMA  
 Spec. : Position the illuminated spot at the center of the vector monitor.

- Repeat steps 3 and 4 several times, position the illuminated spot at the center of the vector monitor.
- Make sure that the carrier leakage at the portion B is not observed.



### Setting After Adjustment

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST SAW → OFF

## 8-13. Black Set Adjustment

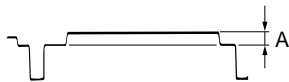
### Preparation

- Lens IRIS → CLOSE
- On the setup menu, set as follows.  
PAGE : S24\*LEVEL 7  
ITEM : TEST OUT → G

### Adjustment procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

- On the setup menu, adjust as follows.  
PAGE : S21\*LEVEL 4  
ITEM : MASTER BLACK  
Spec. :  $A = 10 \pm 1$  IRE (NTSC)  
 $A = 20 \pm 7$  mV (PAL)



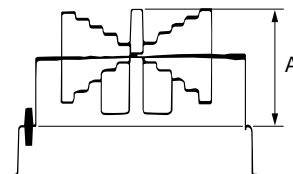
### Setting After Adjustment

- On the setup menu, set as follows.  
PAGE : S24\*LEVEL 7  
ITEM : TEST OUT → ENC
- AUTO W/B BAL switch (front panel) → BLK  
(Perform the automatic black balance adjustment.)

## 8-14. Flare Adjustment

### Preparation

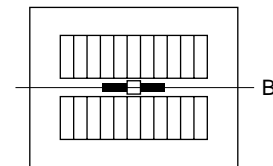
- On the setup menu, set as follows.  
PAGE : S24\*LEVEL 7  
ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.  
Equipment : Waveform monitor  
Test point : TEST OUT connector  
Setting point : ● Lens IRIS  
Spec. : Open the lens iris by one step from the reference setting (NTSC :  $A = 100 \pm 2$  IRE, PAL :  $A = 700 \pm 14$  mV).



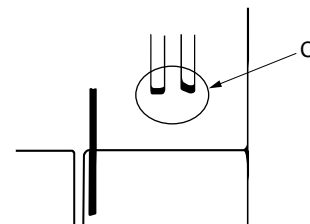
### Adjustment Procedure

Equipment: Waveform monitor  
Test point : TEST OUT connector

- On the setup menu, set as follows.  
PAGE : S24\*LEVEL 7  
ITEM : G FLARE → 0
- Select portion B by using the waveform monitor.



- On the setup menu, adjust as follows.  
PAGE : S24\*LEVEL 7  
ITEM : R FLARE  
Spec. : Minimize the carrier leakage at portion C



- On the setup menu, adjust as follows.  
PAGE : S24\*LEVEL 7  
ITEM : B FLARE  
Spec. : Minimize the carrier leakage at portion C.
- Repeat steps 3 and 4 several times.

## 8-15. Knee and White Clip Adjustments

### 8-15-1. Manual Knee and White Clip Adjustments

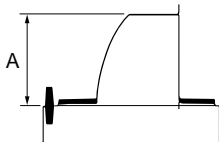
#### Preparation

- OUTPUT/DCC switch (inside panel) → CAM/OFF
- WHITE BAL switch (inside panel) → PRST
- GAIN switch (inside panel) → M (9 dB)
- On the setup menu, set as follows.
  - PAGE : S12\*FUNCTION 1/2
  - ITEM : TEST SAW → ON
  - PAGE : S21\*LEVEL 4
  - ITEM : WHITE CLIP → OFF
  - ITEM : KNEE → OFF

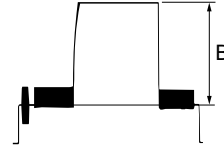
#### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

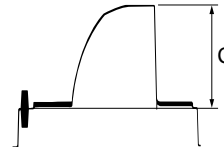
- On the setup menu, set as follows.
  - PAGE : S21\*LEVEL 4
  - ITEM : KNEE SLOPE → -99
- On the setup menu, adjust as follows.
  - PAGE : S21\*LEVEL 4
  - ITEM : KNEE POINT
  - Spec. : A =  $98 \pm 2$  IRE (NTSC)  
A =  $595 \pm 14$  mV (PAL)
- GAIN switch (inside panel) → H (18 dB)
- On the setup menu, set as follows.
  - PAGE : S21\*LEVEL 4
  - ITEM : WHITE CLIP → ON
  - ITEM : KNEE SLOPE → 99



- On the setup menu, adjust as follows.
  - PAGE : S21\*LEVEL 4
  - ITEM : WHITE CLIP LEVEL
  - Spec. : B =  $107 \pm 2$  IRE (NTSC)  
B =  $735 \pm 10$  mV (PAL)



- GAIN switch (inside panel) → M (9 dB)
- On the setup menu, set as follows.
  - PAGE : S21\*LEVEL 4
  - ITEM : WHITE CLIP → OFF
- On the setup menu, adjust as follows.
  - PAGE : S21\*LEVEL 4
  - ITEM : KNEE SLOPE
  - Spec. : C =  $109 \pm 2$  IRE (NTSC)  
C =  $763 \pm 14$  mV (PAL)



#### Setting After Adjustment

- GAIN switch (inside panel) → L (0 dB)
- On the setup menu, set as follows.
  - PAGE : S12\*FUNCTION 1/2
  - ITEM : TEST SAW → OFF
  - PAGE : S21\*LEVEL 4
  - ITEM : WHITE CLIP → ON
  - ITEM : KNEE → ON

#### Note

The values used in the above adjustment are for the conditions that the white clip level is set to 109 IRE (763 mV). When the white clip level is set to a value other than 109 IRE (763 mV), use the following table to set the levels of the knee point and knee slope.

|            | WHITE CLIP LEVEL (Unit : IRE/mV) |         |         |         |
|------------|----------------------------------|---------|---------|---------|
|            | 109/763                          | 107/749 | 105/735 | 103/721 |
| KNEE POINT | 98/686                           | 96/686  | 96/672  | 96/672  |
| KNEE SLOPE | 109/763                          | 107/750 | 107/750 | 107/750 |
| WHITE CLIP | 109/763                          | 107/750 | 105/735 | 103/721 |

## 8-15-2. DCC Pre Knee Adjustment

### Preparation

- OUTPUT/DCC switch (inside panel) → CAM/ON
- GAIN switch (inside panel) → M (9 dB)
- WHITE BAL switch (inside panel) → PRST
- On the setup menu, set as follows.

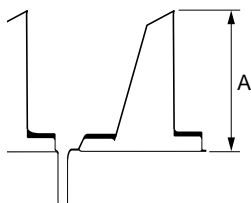
PAGE : S21\*LEVEL 4  
 ITEM : WHITE CLIP → OFF  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : TEST OUT → G  
 ITEM : GAMMA → OFF  
 ITEM : TEST SAW → ON

### Adjustment Procedure

Equipment : Waveform/Vector monitor  
 Test point : TEST OUT connector

1. On the setup menu, adjust as follows.

PAGE : S53\*VA ADJ. 2/2  
 ITEM : G PREKNEE (DCC)  
 Spec. :  $A = 100 \pm 2$  IRE (NTSC)  
            $A = 700 \pm 14$  mV (PAL)

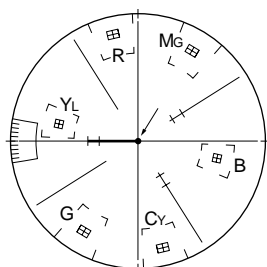


2. On the setup menu, set as follows.

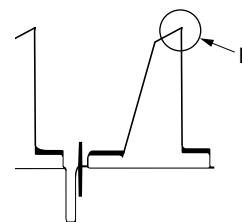
PAGE : S53\*VA ADJ. 2/2  
 ITEM : TEST OUT → ENC

3. On the setup menu, adjust as follows.

PAGE : S53\*VA ADJ. 2/2  
 ITEM : R PREKNEE (DCC)  
 Spec. : Position the illuminated spot at the center of the vector monitor.



4. On the setup menu, adjust as follows.  
 PAGE : S53\*VA ADJ. 2/2  
 ITEM : B PREKNEE (DCC)  
 Spec. : Position the illuminated spot at the center of the vector monitor.
5. Repeat steps 3 and 4 several times, position the illuminated spot at the center of the vector monitor.
6. Make sure that the carrier leakage at portion B is minimum.



### Setting After Adjustment

- On the setup menu, set as follows.


PAGE : S12\*FUNCTION 1/2  
 ITEM : GAMMA → ON  
 ITEM : TEST SAW → OFF  
 PAGE : S21\*LEVEL 4  
 ITEM : WHITE CLIP → ON

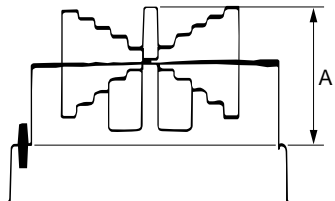
### 8-15-3. DCC Knee Adjustment

#### Note

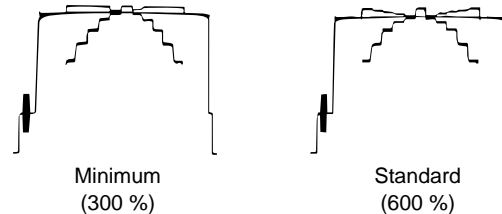
Perform this adjustment, if necessary, to suit the customer's preferences.

#### Preparation

- WHITE BAL switch (inside panel) → PRST
- On the setup menu, set as follows.  
     PAGE : S33\*DCC ADJ.  
     ITEM : DCC POINT → 0  
     ITEM : DCC GAIN → 0
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
- AUTO W/B BAL switch (front panel) → WHT  
     (Perform the automatic white balance adjustment.)
- Equipment : Waveform monitor
- Test point : TEST OUT connector
- Setting point :  Lens IRIS
- Spec. : Open the lens iris by 2.5 steps from the reference setting  
     A =  $100 \pm 2$  IRE (NTSC)  
     A =  $700 \pm 14$  mV (PAL)



4. Return the lens extender to its normal position.
5. On the setup menu, adjust as follows.  
     PAGE : S33\*DCC ADJ.  
     ITEM : DCC GAIN (Factory setting : 0)  
     Spec. : Set the desired knee characteristics.



#### Adjustment Procedure

- Equipment : Waveform monitor
- Test point : TEST OUT connector

1. On the setup menu, adjust as follows.  
     PAGE : S33\*DCC ADJ.  
     ITEM : DCC D RANGE (Factory setting : 500 %)  
     Spec. : Set the desired dynamic range.
2. On the setup menu, adjust as follows.  
     PAGE : S33\*DCC ADJ.  
     ITEM : DCC POINT (Factory setting: 0)  
     Spec. : Set the desired knee characteristics.
3. Select the lens extender, shoot a grayscale chart in the full underscanned monitor frame.

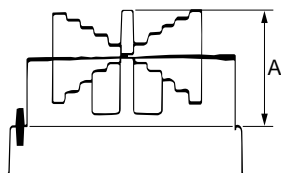


## 8-16. Detail Signal Adjustment

### 8-16-1. Crispening Adjustment

#### Preparation

- On the setup menu, set as follows.  
PAGE : S12\*FUNCTION 1/2  
ITEM : DETAIL → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.  
Equipment : Waveform monitor  
Test point : TEST OUT connector  
Setting point : ●Lens IRIS  
Spec. : A =  $100 \pm 2$  IRE (NTSC)  
A =  $700 \pm 14$  mV (PAL)



#### Adjustment Procedure

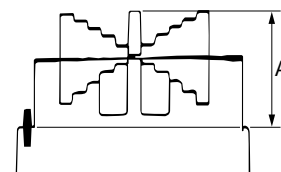
Equipment : Black and white monitor  
Test point : TEST OUT connector

- On the setup menu, adjust as follows.  
PAGE : S16\*LEVEL 1  
ITEM : CRISPENING  
Spec. : Reduce the noise at gray portion to a permissible level.

### 8-16-2. Level Dependent Adjustment

#### Preparation

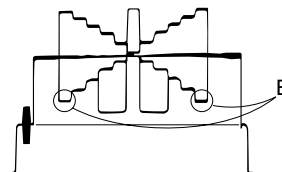
- On the setup menu, set as follows.  
PAGE : S12\*FUNCTION 1/2  
ITEM : DETAIL → ON  
ITEM : TEST OUT → ENC  
PAGE : S16\*LEVEL 1  
ITEM : LVL DEPEND → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.  
Equipment : Waveform monitor  
Test point : TEST OUT connector  
Setting point : ●Lens IRIS  
Spec. : A =  $100 \pm 2$  IRE (NTSC)  
A =  $700 \pm 14$  mV (PAL)



#### Adjustment Procedure

Equipment : Waveform monitor  
Test point : TEST OUT connector

- On the setup menu, adjust as follows.  
PAGE : S16\*LEVEL 1  
ITEM : L.DEP.LVL  
Spec. : Eliminate the detail signal from portion B.



#### Note

After this adjustment, be sure to perform Section 8-16-4 “H/V Ratio Adjustment”, and Section 8-16-5 “Detail Level Adjustment”, in that order.

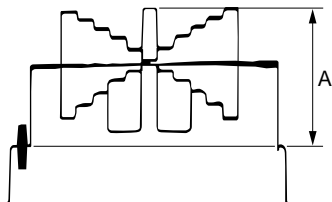
### 8-16-3. Detail Frequency Adjustment

#### Note

Perform this adjustment, if necessary, to suit the customer's preferences.

#### Preparation

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. :  $A = 100 \pm 2$  IRE (NTSC)  
            $A = 700 \pm 14$  mV (PAL)

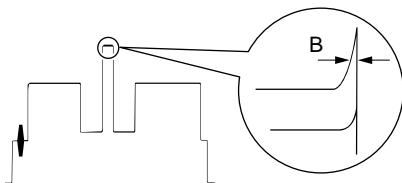


- Select the line at the center white portion of the grayscale chart.

#### Adjustment Procedure

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- On the setup menu, adjust as follows.  
 PAGE : S16\*LEVEL 1  
 ITEM : DTL FREQ. (Factory setting: 0)  
 Spec. : Set the desired width at the edge of portion B.



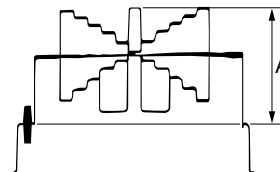
#### Note

After this adjustment, be sure to perform Section 8-16-4 “H/V Ratio Adjustment”, and Section 8-16-5 “Detail Level Adjustment”, in that order.

### 8-16-4. H/V Ratio Adjustment

#### Preparation

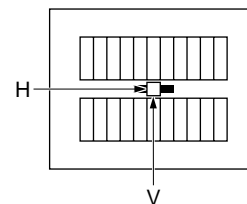
- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point : ● Lens IRIS  
 Spec. :  $A = 100 \pm 2$  IRE (NTSC)  
            $A = 700 \pm 14$  mV (PAL)



#### Adjustment Procedure

Equipment : Black and white monitor  
 Test point : TEST OUT connector

- On the setup menu, adjust as follows.  
 PAGE : S16\*LEVEL 1  
 ITEM : H/V RATIO  
 Spec. : Adjust so that the H and V detail amounts which are added are equivalent.




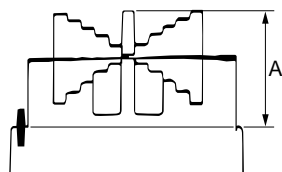
### 8-16-5. Detail Level Adjustment

#### Note

Perform this adjustment, if necessary, to suit the customer's preferences.

#### Preparation

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- Shoot a grayscale chart in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point :  Lens IRIS  
 Spec. : A =  $80 \pm 2$  IRE (NTSC)  
           A =  $560 \pm 14$  mV (PAL)



#### Adjustment Procedure

Equipment : Waveform monitor  
 Test point : TEST OUT connector


- On the setup menu, adjust as follows.  
 PAGE : S16\*LEVEL 1  
 ITEM : DETAIL LVL (Factory setting : 0)  
 Spec. : Adjust to the detail amount which is added to each step in the grayscale chart for the customer's preferences.

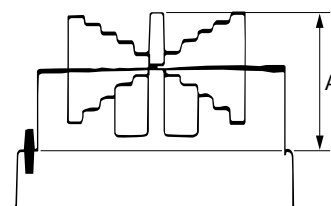
### 8-16-6. Knee Aperture Adjustment

#### Note

Perform this adjustment, if necessary, to suit the customer's preferences.

#### Preparation

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC  
 PAGE : S17\*LEVEL 2  
 ITEM : KNEE APT. → ON
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Setting point :  Lens IRIS  
 Spec. : A =  $100 \pm 2$  IRE (NTSC)  
           A =  $700 \pm 14$  mV (PAL)

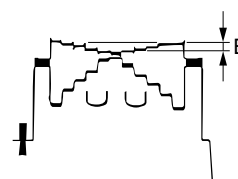


- GAIN switch (inside panel) → M (9 dB)

#### Adjustment Procedure

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- On the setup menu, adjust as follows.  
 PAGE : S17\*LEVEL 2  
 ITEM : K.APT.LVL  
 Spec. : Adjust the peak-to-peak level of the noise at the third steps from the top (portion B) in the grayscale chart, as desired. (Reference level is 40 mV)




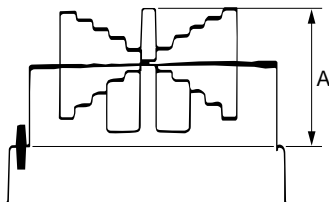
### 8-16-7. H Detail Black Clip Adjustment

#### Note

Perform this adjustment, if necessary, to suit the customer's preferences.

#### Preparation

- On the setup menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point :  Lens IRIS  
 Spec. : Open the lens iris by one step from the reference setting  
 $A = 100 \pm 2$  IRE (NTSC)  
 $A = 700 \pm 14$  mV (PAL)

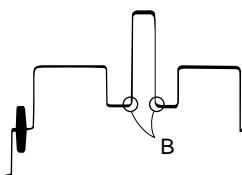


- Select the line at the center white portion of the grayscale chart.

#### Adjustment Procedure

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- On the setup menu, adjust as follows.  
 PAGE : S16\*LEVEL 1  
 ITEM : DTL H B. CLIP (Factory setting : 0)  
 Spec. : Set the edges of portion B to the desired clip level.




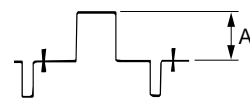
### 8-16-8. V Detail Black Clip Adjustment

#### Note

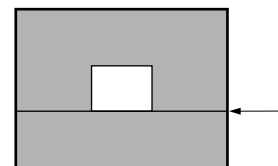
Perform this adjustment, if necessary, to suit the customer's preferences.

#### Preparation

- On the set menu, set as follows.  
 PAGE : S12\*FUNCTION 1/2  
 ITEM : DETAIL → ON  
 ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a white window chart in the full underscanned monitor frame.  
 Equipment : Waveform monitor  
 Test point : TEST OUT connector  
 Setting point :  Lens IRIS  
 Spec. : Open the lens iris by one step from the reference setting  
 $A = 100 \pm 2$  IRE (NTSC)  
 $A = 700 \pm 14$  mV (PAL)



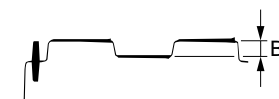
- Select the line at the bottom of the center white portion in the white window chart.



#### Adjustment Procedure

Equipment : Waveform monitor  
 Test point : TEST OUT connector

- On the setup menu, adjust as follows.  
 PAGE : S16\*LEVEL 1  
 ITEM : DTL V B. CLIP (Factory setting : 0)  
 Spec. : Set the level of portion B to the desired level.



## 8-17. Skin Tone Adjustment

### Note

Perform this adjustment, if necessary, to suit the customer's preferences.

### Preparation

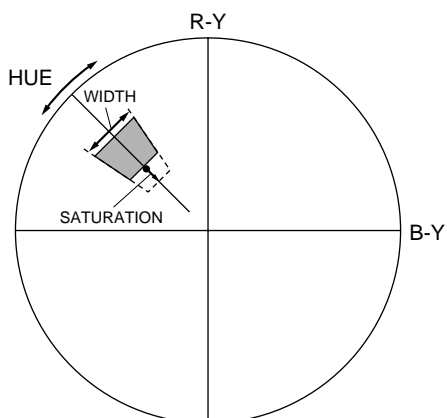
- On the setup menu, set as follows.  
 PAGE : S20\*LEVEL 3  
 ITEM : SKIN TONE DETAIL → ON  
 ITEM : SKIN TONE IND. → ON
- Shoot a person's face.

### Adjustment Procedure

Equipment: Any of color monitor, viewfinder or waveform/vector monitor.

Test point : TEST OUT or VIDEO OUT connector

- Shoot a person's face in the central of the viewfinder.
- On the setup menu, set as follows.  
 PAGE : S20\*LEVEL 3  
 ITEM : SKIN TONE DET. → ?EXEC
- Push the rotary encoder.  
 (The detection area is displayed in a zebra pattern.)
- Perform the adjustment in this step, if necessary.  
 On the setup menu, adjust as follows.  
 PAGE : S20\*LEVEL 3  
 ITEM : SATURATION  
 (Component in the saturation detection)  
 HUE (Hue)  
 WIDTH  
 (Component in the hue direction)



The skin detail detection area is displayed in a zebra pattern.  
 Adjust so that zebra pattern displays only proper area.


- On the setup menu, adjust as follows.  
 PAGE : S20\*LEVEL 3  
 ITEM : SUPPRESS LEVEL (Factory setting : 0)  
 Spec. : Set the level to the desired detail level.

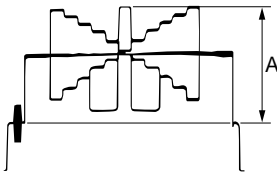
### Setting After Adjustment

- On the setup menu, set as follows.  
 PAGE : S20\*LEVEL 3  
 ITEM : SKIN TONE DETAIL → OFF  
 ITEM : SKIN TONE IND. → OFF  
 ITEM : SKIN TONE DET. → OFF

## 8-18. Zebra Adjustment

### Preparation

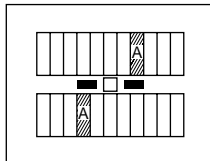
- ZEBRA switch (viewfinder) → ON
- On the setup menu, set as follows.
  - PAGE : S12\*FUNCTION 1/2
  - ITEM : TEST OUT → R, G or B
  - PAGE : S15\*VF SETTING
  - ITEM : ZEBRA SELECT → 1
  - ITEM : ZEBRA1 APT. LVL → 1 %
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
  - Equipment : Waveform monitor
  - Test point : TEST OUT connector
  - Setting point :  Lens IRIS
  - Spec. : A =  $100 \pm 2$  IRE (NTSC)
  - A =  $700 \pm 14$  mV (PAL)



### Adjustment Procedure

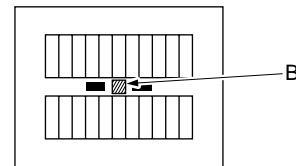
- Equipment : Black and white monitor
- Test point : TEST OUT connector

1. On the setup menu, adjust as follows.
  - PAGE : S15\*VF SETTING
  - ITEM : ZEBRA1 DET. LVL
  - Spec. : Set the condition that zebra pattern appears at the portions A.



2. On the setup menu, set as follows.
  - PAGE : S12\*FUNCTION 1/2
  - ITEM : TEST SAW → ON
3. On the setup menu, adjust as follows.
  - PAGE : S15\*VF SETTING
  - ITEM : ZEBRA1 APT. LVL (Factory setting : 10 %)
  - Spec. : Adjust for the desired width of detection.

4. On the setup menu, set as follows.
  - PAGE : S12\*FUNCTION 1/2
  - ITEM : TEST SAW → OFF
5. On the setup menu, set as follows.
  - PAGE : S15\*VF SETTING
  - ITEM : ZEBRA SELECT → 2
6. On the setup menu, adjust as follows.
  - PAGE : S15\*VF SETTING
  - ITEM : ZEBRA2 DET. LVL
  - Spec. : Set the condition that zebra pattern appears at the portion B.



### Setting After Adjustment

- On the setup menu, set as follows.
  - PAGE : S15\*VF SETTING
  - ITEM : ZEBRA SELECT → 1
  - PAGE : S12\*FUNCTION 1/2
  - ITEM : TEST OUT → ENC

## 8-19. Automatic Iris Adjustment

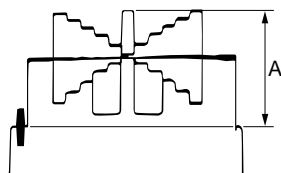
### Preparation

- On the setup menu, set as follows.  
PAGE : S24\*LEVEL 7  
ITEM : TEST OUT → ENC
- OUTPUT/DCC switch (inside panel) → CAM/ON
- Shoot a grayscale chart in the full underscanned monitor frame.
- Lens IRIS → AUTO

### Adjustment Procefure

Equipment : Waveform monitor  
Test point : TEST OUT connector

1. On the setup menu, adjust as follows.  
PAGE : S29\*LEVEL 12  
ITEM : IRIS MODE  
Spec. : Set depending on the application.  
(Automatic iris operation mode setting can be done from the average level to peak-to-peak level of the video signal.)  
IRIS MODE = MIN → peak-to-peak level  
IRIS MODE = MAX → average level
2. On the setup menu, adjust as follows.  
PAGE : S29\*LEVEL 12  
ITEM : IRIS SET  
Spec. : A =  $100 \pm 2$  IRE (NTSC)  
A =  $700 \pm 14$  mV (PAL)



3. On the setup menu, set as follows.  
PAGE : S29\*LEVEL 12  
ITEM : IRIS WEIGHT → 0 (MIN)
4. Shoot an area where the auto iris is not wanted to work in the white window chart.
5. On the setup menu, adjust as follows.  
PAGE : S29\*LEVEL 12  
ITEM : IRIS WEIGHT  
Spec. : Increment the IRIS WEIGHT value until the lens iris is open.

6. On the setup menu, adjust as follows.  
PAGE : S29\*LEVEL 12  
ITEM : IRIS SPEED (Factory setting : 2)  
Spec. : Adjust for the desired operation speed of auto iris.
7. On the setup menu, set as follows.  
PAGE : S29\*LEVEL 12  
ITEM : CLIP HIGH LIGHT → ON or OFF  
Spec. : Set to the desired position.

## 8-20. Adjustment After Replacing the Filter Disk Unit

After replacing the filter disk, the white balance adjustment must be corrected. Follow the correction procedure described below.

---

### Preparation

- WHITE BAL switch (on the inside panel) → Position A or B
- Shoot a fully occupied white area of pattern box in the underscanned monitor frame.
- Lens IRIS → AUTO

---

### Adjustment Procedure

Equipment : Color monitor

1. On the setup menu, set as follows.  
PAGE : S55\*ND COMP.  
ITEM : ND DETECTION → EXEC
2. Set the filter knob to the “1” position.
3. AUTO W/B BAL switch (front panel) → WHT  
(Perform the automatic white balance adjustment.)  
**Note**  
Check that the indication “ND1 DET. = OK!” appears on the color monitor after the automatic white balance adjustment is completed.

4. Set the filter knob to the “2” to “4” positions in turn, and perform step 3 for each position.  
**Note**  
When the adjustment is completed for all knob positions “1” to “4”, the indication “COMPLETE!” appears and the ITEM setup returns automatically to the OFF position.



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